Arlington Valley Energy Facility

Application for a Title V Permit Renewal

Title V Air Quality Permit #V99-014

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Sign-off Sheet

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ABBREVIATIONS

AVEF	Arlington Valley Energy Facility
BACT	Best Available Control Technology
Btu	British Thermal Unit
CAM	Compliance Assurance Monitoring
CEMS	Continuous Emissions Monitoring System
CFR	Code of Federal Regulations
CGA	Cylinder Gas Audits
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Greenhouse Gases Expressed as Carbon Dioxide Equivalent
dscf	Dry Standard Cubic Feet
gal	Gallon
GHG	Greenhouse Gasses
gpm	Gallons per Minute
gr	Grain
GWP	Global Warming Potential
HAP	Hazardous Air Pollutant
HRSG	Heat Recovery Steam Generator
Hz	Hertz
hp	Horsepower
kV	kilovolt
lb/hr	Pounds per Hour
MCAQD	Maricopa County Air Quality Department
MM	Million
MW	Megawatt
N_2O	Nitrous Oxide
NESHAP	National Emission Standards for Hazardous Air Pollutants

ABBREVIATIONS (cont'd)

NH_3	Ammonia
NO_X	Nitrogen Oxides
NSPS	New Source Performance Standards
NSR	New Source Review
O&M	Operations and Maintenance
PM	Particulate Matter
PM_{10}	Particulate Matter Less Than or Equal to 10 Microns in Aerodynamic Diameter
$PM_{2.5}$	Particulate Matter Less Than or Equal to 2.5 Microns in Aerodynamic Diameter
PSD	Prevention of Significant Deterioration
PSEU	Pollutant-Specific Emission Unit
psig	Pounds per Square Inch Gauge
PTE	Potential to Emit
RATA	Relative Accuracy Test Audit
RICE	Reciprocating Internal Combustion Engines
Rules	Maricopa County Air Pollution Control Rules and Regulations
RVP	Reid Vapor Pressure
Scf	Standard Cubic Feet
SCR	Selective Catalytic Reduction
SO_2	Sulfur Dioxide
TOC	Total Organic Carbon
tpy	Tons per Year
ULSD	Ultra-Low Sulfur Diesel
UTM	Universal Transverse Mercator
VOC	Volatile Organic Compounds

1 INTRODUCTION, OVERVIEW, AND ORGANIZATION OF APPLICATION

1.1 INTRODUCTION

Arlington Valley, LLC operates a 580 megawatt (MW) combined cycle power plant at the Arlington Valley Energy Facility (AVEF) in Arlington, Arizona in accordance with Title V Air Quality Operating Permit #V99-014, issued by the Maricopa County Air Quality Department (MCAQD) on November 20, 2000. In accordance with Condition 14.E.1 of Permit #V99-014 and as required by Maricopa County Air Pollution Control Rules and Regulations (Rules), Rule 210 §301, AVEF is submitting this application for renewal of its Title V Air Quality Operating Permit. The following sections of this document provide all of the information required by Rule 210 §301.4(a) for a renewal permit application.

1.2 OVERVIEW

1.2.1 Operations

AVEF is a natural gas-fired combined-cycle power plant designated to operate commercially as a merchant power plant in Maricopa County, Arizona. A merchant power plant is a power generation facility that produces electricity for the deregulated electricity market without pre-arranged long-term utility power purchase agreements. AVEF is a nominal 580 MW facility and is designed to convert clean natural gas to useful power at high efficiency and low cost. AVEF employs control technologies and/or good combustion practices to minimize air emissions. A process flow diagram of the AVEF facility is presented in Figure B.1 of Appendix B.

1.2.2 Permitting Classification

The AVEF is a categorical source for Prevention of Significant Deterioration (PSD) purposes pursuant to Rule 240 and is, therefore, subject to a 100 tons per year (tpy) potential to emit (PTE) threshold for PSD major source determination. Maricopa County's Title V program, set forth in Rule 210, defines a Title V major source (in part) as a source with a PTE of at least 100 tpy of regulated air pollutants. The facility-wide PTE of the AVEF is presented in Table 1.1. The PTE is above the 100 tpy Title V permitting and PSD thresholds for particulate matter equal to or less than 10 microns in aerodynamic diameter (PM_{10}), particulate matter equal to or less than 2.5 microns in aerodynamic diameter ($PM_{2.5}$), carbon monoxide (CO), nitrogen oxides (NO_X), and volatile organic compounds (VOC). Additionally, the PTE is above the 100,000 tpy PSD threshold for greenhouse gases (CO_2e). The PTE is below the 100 tpy Title V permitting and PSD thresholds for sulfur dioxide (SO_2), the 25 tpy Title V permitting threshold for all hazardous air pollutants (HAPs) combined, and the 10 tpy Title V permitting threshold for any single HAP. Consequently, the AVEF is a Title V major source, which necessitates a Title V air quality permit.

Table 1.1 PTE of AVEF

Regulated Air Pollutant	PTE (tpy) [a]
PM	273.76
PM10	223.89
PM2.5	223.89
CO	894.07
NOX	250.39
SO2	39.80
VOC	125.21
CO2e	2,163,328
Total HAPs	11.12
Greatest Single HAP (formaldehyde)	5.81

[a] Because AVEF is Natural Gas Fired power plant, which is a categorical source, both non-fugitive and fugitive emissions are included in the determination of the PTE for permit applicability purposes.

1.3 ORGANIZATION OF APPLICATION

This renewal application is structured such that the different types of information required by Rule 210 §301.4(a) are presented in separate sections and/or appendices. A completeness checklist listing all of the information required by Rule 210 §301.4(a) and where the information can be located in the application is presented in Table 1.2.

Table 1.2 MCAQD Title V Air Quality Permit Application Information Requirements

Filing Instruction Number	Information Required	Included in Application?		Section in Application
		Yes	No	
N/A	Standard Permit Application Form Including the Emission Source Form	X		Appendix A
1.	Description of the process to be carried out in each unit.	X		Section 2
2.	Description of product.	X		Section 2
3.	Description of alternate operating scenario (if desired).		X [a]	--
4.	Description of alternate operating scenario product (if applicable).		X [a]	--
5.	A flow diagram for all processes.	X		Appendix B
6.	A material balance for all processes (if applicable).	X [b]		Appendix C
7.	Emissions related information.	X		Section 3
8.	Citation and description of all applicable requirements.	X		Section 4
9.	Explanation of any voluntarily accepted limits and any proposed exemptions from otherwise applicable requirements.	X		Section 5
10.	Process rate information, fuel burning equipment information, raw material information, operating schedules, limitations, and compliance with limitation information.	X		Section 6
11.	Process and control equipment details.	X		Section 7

Table 1.2 MCAQD Title V Air Quality Permit Application Information Requirements

Filing Instruction Number	Information Required	Included in Application?		Section in Application
		Yes	No	
12.	Stack Information.	X		Section 8
13.	Site diagram.	X		Section 9
14. and 15.	Air pollution control information.	X		Section 10
16.	Compliance plan.	X		Section 11
17.	Compliance certification.	X		Appendix A
18.	New major source/major modification information.		X [c]	--
19.	Emission calculation information.	X		Appendix C

[a] AVEF does not have and does not propose any alternate operating scenarios.

[b] Material balance is used only for calculation of SO_2 emissions from natural gas and diesel fuel burning equipment. The material balance procedures are presented with all other emission calculation methodologies in Appendix C.

[c] The information necessary to show compliance with Rule 240 is required only for new major sources or major modifications. It is not required for permit renewal applications.

2 PROCESS AND PRODUCT DESCRIPTION

Descriptions of all major and supporting operations at the AVEF are presented in the following sections. A process flow diagram of the operations at the AVEF is presented in Figure B.1 of Appendix B.

2.1 POWER GENERATION FACILITY

AVEF has two nominal gross 168 MW General Electric 7FA natural gas-fired combustion turbines operating in combined-cycle mode with two supplementary fired, three-pressure Heat Recovery Steam Generators (HRSGs) and a common, reheat condensing steam turbine. Steam generation in the HRSGs is augmented with supplementary natural gas-firing using duct burners. Each HRSG produces high pressure steam at approximately 1,800 pounds per square inch gauge (psig) for introduction into the steam turbine. The steam turbine drives an additional generator to increase the total plant output to about 510 MW without duct firing or 580 MW with duct firing and inlet air chilling.

2.2 COMBINED CYCLE POWER GENERATION

The production of electricity using a combustion turbine engine coupled with a shaft driven generator is referred to as the Brayton Cycle. This power generation cycle has a thermal efficiency which generally approaches 40 percent. This is also referred to as "simple-cycle" and has been traditionally utilized for electricity peaking generation since the unit and its output can be brought on line very quickly. The largest energy loss from this cycle is from the turbine exhaust in which heat is discarded to the atmosphere at about 1,100°F.

The Rankine Cycle represents the traditional method of generating power from utility steam electric power plants. In this cycle, boilers are used to produce high pressure steam which is expanded in a steam turbine to drive an electric generator. Rankine cycle plants have a typical thermal efficiency of less than 35 percent. The largest energy losses from this cycle are from the boiler stack that exhaust at about 350°F and from heat rejected in the steam turbine condenser. Due to their low thermal efficiency, these plants were traditionally designed to burn inexpensive, low-grade fuels such as coal or residual fuel oil. Relatively high stack temperatures are necessary with these fuels in order to prevent stack corrosion. The need to reject large quantities of heat from the steam turbine is the reason many utility power plants were sited next to a large source of cooling water.

AVEF combines the Brayton and Rankine cycles to maximize thermal efficiency. Natural gas is combusted in two Brayton Cycle turbines that generate most of the electrical output. Instead of being discarded to the environment, the exhaust heat is recovered in a Rankine Cycle HRSG/steam turbine, and the heat is extracted until the exhaust temperature is about 200°F before being discharged through the stacks. This results in an overall thermal efficiency of over 55 percent. This design consumes only about two thirds of the fuel that would be

consumed in a conventional utility power plant to produce the same amount of electricity. This state-of-the-art, high-efficiency technology combined with the exclusive use of the cleanest fossil fuel (natural gas) and the application of Best Available Control Technology (BACT), yields a small fraction of the air emissions of a similarly sized conventional power plant.

2.3 MAJOR FACILITY COMPONENTS

The primary sources of criteria pollutants associated with the AVEF are two gas-fired combustion turbines with two HRSGs and supplementary duct burners that will exhaust through two independent stacks. Other sources of criteria pollutants include a gas-fired auxiliary boiler, a cooling tower, a small diesel fire-water pump and a back-up generator. There is an insignificant amount of emissions associated with ancillary facilities, including two small diesel storage tanks for the fire-water pump and back-up generator, small acid storage tank(s) used in the treatment of process water, and an ammonia tank used to store aqueous ammonia solution used in Selective Catalytic Reduction (SCR) systems to control NO_X emissions. A brief description of each major component of the facility is provided in the following sections.

2.3.1 Gas Turbines

AVEF consists of two advanced firing, GE 7FA gas turbines in combined-cycle mode with duct fired HRSGs and a common steam turbine generator (nominal 580 MW). The fuel is exclusively pipeline quality natural gas. AVEF is designed to operate without backup fuel oil capability to help minimize air pollutant emissions to the atmosphere. Each gas turbine power block includes an air compressor section, gas combustion system (utilizing advanced dry low-NOx combustors), power turbine, and a 60-hertz (Hz), 18 kilovolt (kV) generator. Each gas turbine generator is designed to produce approximately 168 MW of net electrical power.

The gas turbine is the heart of a combined-cycle power system. First, air is filtered, cooled, and compressed in a multiple-stage axial flow compressor. Compressed air and natural gas are mixed and combusted in the turbine combustion chamber. Lean pre-mix dry low-NOX combustors minimize NO_X formation during combustion. Exhaust gas from the combustion chamber is expanded through a multi-stage power turbine that drives both the air compressor and electric power generator. Exhaust gas exiting the power turbine at approximately 1,100°F is ducted to a waste heat boiler commonly known as a HRSG where steam is produced to generate additional electricity in a steam turbine generator(s). Gas fired duct burners located within the HRSGs are used for supplementary firing to increase steam output.

The combustion turbines are designed to operate in the dry low-NOX (lean pre-mix) mode at loads from about 60 percent up to base load rating and will normally be taken out of service

only for scheduled maintenance, or as dictated by economic or electrical demand conditions.

2.3.2 Heat Recovery Steam Generators

A horizontal, natural circulation, three-pressure HRSG system extracts heat from the exhaust of each gas turbine. Exhaust gas entering the HRSG at approximately 1,100°F is cooled to approximately 200°F by the time it leaves the HRSG exhaust stack. Steam production in the HRSGs is augmented using "low-NOX" duct burners that are natural gas-fired and rated at 356.6 MMBtu/hour each. The steam produced is used in the combined-cycle plant for additional power and natural gas/feed water heating. Each HRSG includes a high-pressure superheater, high-pressure evaporator, high-pressure economizer, reheat section (to reheat partially expanded steam), intermediate-pressure superheater, intermediate-pressure evaporator, intermediate-pressure economizer, low-pressure superheater, low-pressure evaporator, and condensate/feedwater preheater.

2.3.3 Steam Turbine

AVEF includes one reheat, condensing steam turbine. The high-pressure portion of the steam turbine receives high-pressure superheated steam from the HRSGs, and exhausts to the reheat section of the HRSGs. The steam from the reheat section of the HRSGs is supplied to the intermediate-pressure section of the turbine, which expands to the low-pressure section. The low-pressure turbine also receives excess low-pressure superheated steam from the HRSGs and exhausts to the surface condenser.

2.3.4 Auxiliary Boiler

A package boiler, rated at a maximum of 33 MMBtu/hour, is used to supply heating steam for steam turbine seals and for sparging of the HRSG steam drums during down periods. The boiler is a fire-tube type and combusts natural gas only. Make-up water is received from the demineralizer system that feeds the auxiliary boiler deaerator. The primary use of the auxiliary boiler is to maintain steam flow and operating temperatures within the HRSGs and steam turbine while the combustion turbines are off line. By maintaining steam temperatures within the turbine seals, piping, and HRSGs, the amount of time required to start-up the combustion turbines from a shutdown mode is minimized. Steam from the auxiliary boiler is not used to augment the power generation of the combustion turbines or the steam turbine. Although the auxiliary boiler is not intended for full time operation, full time operation has been assessed in this application to provide maximum operational flexibility.

2.3.5 Process Cooling

AVEF is designed to use a six cell cooling tower. The majority of the cooling water is used in the surface condenser to absorb heat rejected from the steam turbine. Water from the cooling tower is commonly referred to as "main" cooling water. A dedicated set of cooling

water pumps is provided for this service. Additional cooling water is required for auxiliary plant cooling. Cooling tower water is not used for direct cooling of plant auxiliaries; a closed loop auxiliary cooling system consisting of pumps, expansion tank, and heat exchangers is provided for this purpose. Cooling tower water circulated through a set of plate and frame heat exchangers cools a closed loop coolant, usually a glycol/water mixture; this is commonly referred to as "auxiliary" cooling water. The cooling tower itself is a device designed to evaporate clean water to provide cooling. Some small water droplets (referred to as drift) escape from the top of the tower, and may liberate dissolved solids as they evaporate in the atmosphere. These emissions are controlled by the installation of drift eliminators as BACT.

2.3.6 Inlet Chilling System

The combustion turbines employ inlet chillers during hot ambient conditions to recover power output that would normally be lost due to lower air density at higher ambient temperatures. The process of cooling takes place at the cooling coils where inlet air is cooled before entering the combustion turbine compressor. The inlet chilling system uses a propylene glycol and water mixture to cool the inlet air to the combustion turbines. The propylene glycol mixture is then cooled using heat exchangers and the associated cooling towers (three modules) for heat dissipation. At lower temperature, the air becomes denser and therefore more mass flows through the combustion turbines. The net increase in mass flow results in higher output for each of the combustion turbines by up to 45.5 MW. In addition to the output enhancement from the combustion turbines, the additional mass flow also increases output of the steam turbine by approximately 15.5 MW.

2.3.7 Fuel Gas System

Pipeline quality natural gas is delivered to the plant boundary at a pressure sufficient for use in the combustion turbines without additional fuel compression. The gas must be heated to approximately 365°F using steam from the HRSGs.

Natural gas first flows through a knockout drum for removal of any liquid which may have been carried through from the pipeline. The gas then passes through a filter/separator to remove particulate matter and entrained liquid. The gas flows through the filter/separator's first chamber, the filtration section, where entrained liquid is coalesced on the filter cartridges, drops to the bottom of the chamber and either vaporizes and returns to the main gas stream or drains to the sump below. The gas then flows through the coalescing filters that remove particulate matter. The gas then passes to the second chamber, the separation section, where any entrained liquid remaining in the stream is further separated by impingement on a net or labyrinth and drains to the bottom sump. Two filter/separators are included: one in service and one spare. Hydrocarbon liquids in the sump are returned to the gas stream. The gas is preheated and split into two streams, one for each combustion turbine. Finally, the gas is delivered to the combustion turbines and combusted as part of the power generation operation.

2.3.8 On-Site Diesel Engines

Currently one small diesel engine, nominally 161 horsepower (hp), is located on-site and operated as an emergency fire-water pump driver. The facility operations plan calls for this unit to be operated less than 500 hours per year. The engine is equipped with a 350 gallon fuel storage tank (horizontal tank, 6.5 feet long x 3 feet 2 inches diameter). Additionally, one small diesel engine, rated at 748 hp, is located on-site to provide power to the steam turbine turning gear and lube oil pump in blackout conditions. This engine is operated less than 500 hours per year and has an associated 1,640 gallon fuel storage tank (horizontal tank, 12 feet long x 5 feet diameter).

2.3.9 Ancillary Facilities

Other systems supporting plant operations include:

- Cooling tower water treatment system;
- Chiller cooling towers;
- Plant sumps, sump pumps, and an oil water separator;
- Feed water treatment systems including:
    - One 19,500 gallon Demineralizer Regeneration Tank, storing sulfuric acid
    - One 68,000 gallon Neutralization Tank, storing a water/sodium sulfate solution
    - One 19,500 gallon Demineralizer Regeneration Tank, storing sodium hydroxide solution
- Plant and instrument air compressors and auxiliary equipment;
- Sanitary lift station;
- Knock out drum;
- Steam and water sampling systems;
- Deaerator vent; and an
- Ammonia tank.

2.3.10 Emission Control

AVEF is designed with advanced emissions control technology. For the reduction of NO_X emissions, the combustion turbines have dry, low-NO_X burners and SCR systems. The facility is designed to meet a 2.5 ppm NO_X limit. Clean burning natural gas as fuel produces less PM_{10} and SO_2 emissions than alternative fuels. An SCR system is BACT for the control of NO_X emissions from the combustion turbines and duct burners. The SCR system consists of a modular foil catalyst bed and a support structure located within the HRSG at the point where the flue gas temperature is optimized for SCR conversion of NO_X and an ammonia (NH_3)

injection grid located within the HRSG upstream of the catalyst. Support facilities for the SCR system include an aqueous ammonia (ammonium hydroxide, <20% solution) off-loading facility and a 21,000 gallon storage tank (16 feet tall x 15 feet diameter).

2.3.11 Emission Monitoring

Each combustion turbine is equipped with a continuous emissions monitoring system (CEMS). The CEMS is designed to sample NO_X, CO and O_2 in accordance with New Source Performance Standards (40 Code of Federal Regulations (CFR) 60 Appendix B) and Title IV Acid Rain Program (40 CFR 75) requirements.

3 EMISSION INFORMATION

The emission units associated with the AVEF are identified in Table 3.1. Detailed information about the emission units are also presented in Table 3.1. This information includes: (a) the identification of the regulated air pollutants emitted; (b) the classification of emissions as fugitive or non-fugitive; (c) maximum processes rates on an hourly and annual basis; and (d) potential emissions on an hourly and annual basis. Table 3.1 does not include processes at the AVEF that do not have the potential to emit regulated air pollutants, are insignificant activities, or are trivial activities.

Table 3.2 sums the potential emissions from each emission unit to present total facility-wide emissions for the AVEF. Because the AVEF is a categorical source, both non-fugitive and fugitive emissions are included in the determination of the PTE of regulated pollutants for permit applicability purposes.

As discussed in Section 1.2.2 and shown in Table 3.2, the PTE of facility-wide operations at the AVEF is above the 100 tpy Title V permitting and PSD thresholds for PM_{10}, $PM_{2.5}$, CO, NO_X, and VOC. Additionally, the PTE is above the 100,000 tpy PSD threshold for CO_2e. The PTE is below the 100 tpy Title V permitting and PSD thresholds for SO_2, the 25 tpy Title V permitting threshold for total HAPs, and the 10 tpy Title V permitting threshold for any single HAP. Consequently, the AVEF is a Title V major source.

The methodology used to calculate the potential emissions of each emission unit at the AVEF facility is presented in Appendix C. Detailed calculations of potential emissions are presented in Appendix D.

Table 3.1 Potential Emissions from the Emission Units at the AVEF

Emission Unit Description	Non-Fugitive or Fugitive Classification	Maximum Process Rates		Regulated Air Pollutant	Potential Emissions [a]	
		Hourly	Annual		lb/hr	tpy
Combustion Turbine 1 with Duct Burner 1 (combined cycle) [b, c, d, e]	Non-Fugitive	1 hour @ 1,740.805 MMBtu/hr (Combustion Turbine 1) and 356.6 MMBtu/hr (Duct Burner 1)	8,760 hours @ 1,740.805 MMBtu/hr (Combustion Turbine 1) and 356.6 MMBtu/hr (Duct Burner 1)	PM	24.00	99.90
				PM_{10}	24.00	99.90
				$PM_{2.5}$	24.00	99.90
				CO	1,260.00	438.10
				NO_X	215.95	121.10
				SO_2	5.25	19.80
				VOC	38.38	61.60
				CO_2e	245,602	1,075,737
				Total HAPs	1.25E+00	5.49E+00

Table 3.1 Potential Emissions from the Emission Units at the AVEF

Emission Unit Description	Non-Fugitive or Fugitive Classification	Maximum Process Rates		Regulated Air Pollutant	Potential Emissions [a]	
		Hourly	Annual		lb/hr	tpy
Combustion Turbine 2 with Duct Burner 2 (combined cycle) [b, c, d, e]	Non-Fugitive	1 hour @ 1,740.805 MMBtu/hr (Combustion Turbine 2) and 356.6 MMBtu/hr (Duct Burner 2)	8,760 hours @ 1,740.805 MMBtu/hr (Combustion Turbine 2) and 356.6 MMBtu/hr (Duct Burner 2)	PM	24.00	99.90
				PM_{10}	24.00	99.90
				$PM_{2.5}$	24.00	99.90
				CO	1,260.00	438.10
				NO_X	215.95	121.10
				SO_2	5.25	19.80
				VOC	38.38	61.60
				CO_2e	245,602	1,075,737
				Total HAPs	1.25E+00	5.49E+00

Table 3.1 Potential Emissions from the Emission Units at the AVEF

Emission Unit Description	Non-Fugitive or Fugitive Classification	Maximum Process Rates		Regulated Air Pollutant	Potential Emissions [a]	
		Hourly	Annual		lb/hr	tpy
Auxiliary Boiler [c, d]	Non-Fugitive	1 hour @ 33 MMBtu/hr	6,000 hours @ 33 MMBtu/hr	PM	0.33	0.90
				PM_{10}	0.33	0.90
				$PM_{2.5}$	0.33	0.90
				CO	4.95	14.10
				NO_X	1.16	3.30
				SO_2	0.08	0.20
				VOC	0.53	1.50
				CO_2e	3,864	11,593
				Total HAPs	5.26E-03	1.58E-02

Table 3.1 Potential Emissions from the Emission Units at the AVEF

Emission Unit Description	Non-Fugitive or Fugitive Classification	Maximum Process Rates		Regulated Air Pollutant	Potential Emissions [a]	
		Hourly	Annual		lb/hr	tpy
Engine Associated with the Fire Water Pump (emergency)	Non-Fugitive	1 hour @ 161 hp	500 hours @ 161 hp	PM	0.35	0.09
				PM_{10}	0.35	0.09
				$PM_{2.5}$	0.35	0.09
				CO	1.08	0.27
				NO_X	4.99	1.25
				SO_2	0.002	0.0004
				VOC	0.40	0.10
				CO_2e	184.39	46.10
				Total HAPs	4.37E-03	1.09E-03

Table 3.1 Potential Emissions from the Emission Units at the AVEF

Emission Unit Description	Non-Fugitive or Fugitive Classification	Maximum Process Rates		Regulated Air Pollutant	Potential Emissions [a]	
		Hourly	Annual		lb/hr	tpy
Engine Associated with the Backup Generator (emergency)	Non-Fugitive	1 hour @ 748 hp	500 hours @ 748 hp	PM	0.68	0.17
				PM_{10}	0.68	0.17
				$PM_{2.5}$	0.68	0.17
				CO	14.02	3.50
				NO_X	14.55	3.64
				SO_2	0.008	0.002
				VOC	1.65	0.41
				CO_2e	856.68	214.17
				Total HAPs	8.24E-03	2.06E-03

Table 3.1 Potential Emissions from the Emission Units at the AVEF

Emission Unit Description	Non-Fugitive or Fugitive Classification	Maximum Process Rates		Regulated Air Pollutant	Potential Emissions [a]	
		Hourly	Annual		lb/hr	tpy
Wet Cooling Tower	Fugitive	1 hour @ 138,300 gal/min	8,760 hours @ 138,300 gal/min	PM	13.19	57.77
				PM_{10}	4.15	18.20
				$PM_{2.5}$	4.15	18.20
Chiller Module 1	Fugitive	1 hour @ 12,000 gal/min	8,760 hours @ 12,000 gal/min	PM	1.14	5.01
				PM_{10}	0.36	5.01
				$PM_{2.5}$	0.36	5.01
Chiller Module 2	Fugitive	1 hour @ 12,000 gal/min	8,760 hours @ 12,000 gal/min	PM	1.14	5.01
				PM_{10}	0.36	5.01
				$PM_{2.5}$	0.36	5.01

Table 3.1 Potential Emissions from the Emission Units at the AVEF

Emission Unit Description	Non-Fugitive or Fugitive Classification	Maximum Process Rates		Regulated Air Pollutant	Potential Emissions [a]	
		Hourly	Annual		lb/hr	tpy
Chiller Module 3	Fugitive	1 hour @ 12,000 gal/min	8,760 hours @ 12,000 gal/min	PM	1.14	5.01
				PM_{10}	0.36	5.01
				$PM_{2.5}$	0.36	5.01
Hydrochloric Acid Tank [f]	Non-Fugitive	1 hour @ 17.1 gal/hour throughput (35% HCl Solution)	8,760 hours @ 17.1 gal/hour (35% HCl Solution)	HCl	2.70E-02	1.18E-01

[a] CO_2e emissions are calculated by summing the individual greenhouse gas emissions multiplied by their global warming potential (GWP). GWP of CO_2 = 1, GWP of CH_4 = 25, GWP of N_2O = 298.

[b] Calculation of worst case potential emissions assumes operation of the AVEF in combined-cycle mode.

[c] Annual emissions based on the tpy limits in Condition 18.A.2, Table 1 of Permit #V99-014.

[d] Hourly emissions based on the lb/hour, lb/event, and lb/MMBtu limits in Condition 18.A.2, Table 2-5 of Permit #V99-014.

[e] Hourly emissions assume the Combined Cycle Systems are operating in startup mode (worst case emission estimate).

[f] Hourly emissions calculated by dividing the annual emissions calculated by EPA TANKS version 2.0.9.d

Table 3.2 Annual Potential Emissions from the Emission Units at the AVEF

Emission Unit Description	Non-Fugitive, Fugitive, or Total	Potential Emissions (tpy)								
		PM	PM_{10}	$PM_{2.5}$	CO	NO_X	SO_2	VOC	CO_2e	Total HAPs [a]
Combustion Turbine 1 with Duct Burner 1 (combined cycle)	Non-Fugitive	99.90	99.90	99.90	438.10	121.10	19.80	61.60	1,075,737	5.49E+00
Combustion Turbine 2 with Duct Burner 2 (combined cycle)	Non-Fugitive	99.90	99.90	99.90	438.10	121.10	19.80	61.60	1,075,737	5.49E+00
Auxiliary Boiler	Non-Fugitive	0.90	0.90	0.90	14.10	3.30	0.20	1.50	11,593	1.58E-02
Engine Associated with the Fire Water Pump (emerg.)	Non-Fugitive	0.09	0.09	0.09	0.27	1.25	0.0004	0.10	46.10	1.09E-03
Engine Associated with the Backup Generator (emerg.)	Non-Fugitive	0.17	0.17	0.17	3.50	3.64	0.002	0.41	214.17	2.06E-03
Wet Cooling Tower	Fugitive	57.77	18.20	18.20	--	--	--	--	--	--
Chiller Module 1	Fugitive	5.01	1.58	1.58	--	--	--	--	--	--
Chiller Module 2	Fugitive	5.01	1.58	1.58	--	--	--	--	--	--
Chiller Module 3	Fugitive	5.01	1.58	1.58	--	--	--	--	--	--
Hydrochloric Acid Tank (35% Solution)	Non-Fugitive	--	--	--	--	--	--	--	--	1.18E-01
Total	**Non-Fugitive**	**200.96**	**200.96**	**200.96**	**894.07**	**250.39**	**39.80**	**125.21**	**2,163,328**	**11.12**
	Fugitive	**72.81**	**22.93**	**22.93**	**--**	**--**	**--**	**--**	**--**	**--**
	Total	**273.76**	**223.89**	**223.89**	**894.07**	**250.39**	**39.80**	**125.21**	**2,163,328**	**11.12**

[a] The greatest single HAP emitted from the AVEF is formaldehyde with total emissions of 5.81 tpy.

4 APPLICABLE REQUIREMENTS

The regulatory requirements applicable to the AVEF and all activities, processes, and emission units that require a permit are presented in Table 4.1. Table 4.1 also presents the methods used to demonstrate compliance with the applicable requirements. The requirements applicable to activities, processes, and emission units that are not subject to a source-specific applicable requirement, do not have the potential to emit regulated air pollutants, are insignificant activities, or are trivial activities are not identified in Table 4.1. The AVEF will continue to comply with all requirements currently applicable and any additional requirements that become applicable during the permit term.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
All activities, processes, and emission units (i.e., facility-wide operations)	Rule 240 §301	Do not operate other major equipment other than the currently permitted equipment unless a permit revision is obtained first.	Maintenance of records, follow procedures for obtaining a permit revision.
	Rule 140 §500 SIP Rule 140	Report excess emissions by: • Providing notification by telephone or facsimile within 24 hours of the time when the occurrence of excess emissions was first learned. Include all necessary and available information in the notification; and • Submitting a detailed written excess emissions report within 72 hours of the telephone/facsimile notification.	Timely notification and reporting of excess emissions.
	Rule 200 §312	Keep a complete permit clearly visible and accessible on the site where the equipment is installed.	Proper posting of permit.
	Rule 200 §409 Rule 210 §302.1(i) Rule 210 §401 SIP Rule 28	Payment of applicable fees.	Payment of fees.
	Rule 100 §505 SIP Rule 40	Submittal of annual emission inventory questionnaires.	Timely submittal of questionnaires.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
All activities, processes, and emission units (i.e., facility-wide operations) (cont'd)	40 CFR 98	Meet the requirements for reporting GHG emissions.	Maintenance of records; electronic submittal of Annual GHG Reports.
	Rule 300 §301	Opacity ≤ 20% for any single source of emissions for periods aggregating more than three minutes in any 60-minute period (not including uncombined water).	Visible emission monitoring; performance of EPA Reference Method 9 Test.
	SIP Rule 30	Opacity ≤ 40% for any source of emissions (not including uncombined water) except as otherwise provided in Regulation I, Rule 4, Exceptions.	Visible emission monitoring; performance of EPA Reference Method 9 Test.
	Rule 360 §301 40 CFR 60.11(c)	For sources subject to NSPS, the opacity standards apply at all times except during periods of startup, shutdown, malfunction, and as otherwise provided in the applicable standard.	Maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
All activities, processes, and emission units (i.e., facility-wide operations) (cont'd)	SIP Rule 32F	Limit ground level concentrations at any place beyond the premises on which the AVEF is located to: • $SO_2 \leq 850$ µg/m^3 (1 hour average) • $SO_2 \leq 250$ µg/m^3 (24 hour average) • $SO_2 \leq 120$ µg/m^3 (72 hour average)	Use of low sulfur fuel; fuel supplier certifications; maintenance of records.
	Rule 320 §300 SIP Rule 32A	Do not emit gaseous or odorous air contaminants from equipment, operations or premises under his control in such quantities or concentrations as to cause air pollution.	Maintenance of records of measures used to limit emissions.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
All activities, processes, and emission units (i.e., facility-wide operations) (cont'd)	Rule 320 §302 SIP Rule 32C	Process, store, use and transport materials including, but not limited to, solvents or other volatile compounds, paints, acids, alkalies, pesticides, fertilizer and manure in such a manner and by such means that they will not unreasonably evaporate, leak, escape or be otherwise discharged into the ambient air so as to cause or contribute to air pollution. Where means are available to reduce effectively the contribution to air pollution from evaporation, leakage or discharge, install and use such control methods, devices or equipment.	Maintenance of records of measures used to limit emissions.
	Rule 320 §303 SIP Rule 32D	Where a stack, vent or other outlet is at such a level that air contaminants are discharged to adjoining property, the Control Officer may require the installation of abatement equipment or the alteration of such stack, vent, or other outlet to a degree that will adequately dilute, reduce or eliminate the discharge of air contaminants to adjoining property.	Maintenance of records of action taken.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
All activities, processes, and emission units (i.e., facility-wide operations) (cont'd)	Rule 320 Rule 210 §302.1 SIP Rule 32D	Maintain a log of complaints of odors detected off-site containing the following: • Description of the complaint; • Date and time that the complaint was received; • Name and/or phone number of the complainant (if given); • Actions performed to investigate the complaint; • Results of the investigation; and • Any corrective actions taken.	Maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
All activities, processes, and emission units (i.e., facility-wide operations) (cont'd)	Rule 300 Rule 210 Rule 210 §302.1(d) SIP Rule 30	Maintain records on site of following: • Dates on which visible emissions observations were taken, the method used, and the results of the observations; • Stack emissions test results related to emission limits and/or operational requirements; • Odor log; and • Any other records and reports required by the applicable requirements.	Maintenance of records.
	Rule 300 Rule 210 §302.1(c)(1) SIP Rule 30	Conduct monthly facility walk-throughs to observe visible emissions from each combined cycle system exhaust stack, the Auxiliary Boiler, and the diesel fuel engines. Observe the engines when the equipment is operating. Log the visual observations, including the date and time when that reading was taken, results of the reading, name of the person who took the reading and any other related information.	Visible emission monitoring; performance of EPA Reference Method 9 Test (if necessary).

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
All activities, processes, and emission units (i.e., facility-wide operations) (cont'd)	Rule 210 §302.1(c)(1) SIP Rule 30	If visible emissions are observed from any device capable of emitting any air contaminant (other than condensed water and trace amounts of other chemical elements or compounds) and an opacity violation has not occurred in the 12 months preceding the observation, obtain an opacity reading conducted by a certified visible emissions reader. Take the reading within three days of the observance of visible emissions and take weekly thereafter until there are no visible emissions. If the problem is corrected before three days has passed, and no emissions are visible, it is not required to conduct the certified reading. If an opacity violation has occurred at the facility in the 12 months preceding the observation of visible emissions, take the required opacity reading by a certified visible emissions reader within 24 hours of the observation of visible emissions.	Performance of EPA Reference Method 9 Test.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
All activities, processes, and emission units (i.e., facility-wide operations) (cont'd)	Rule 360 §301 40 CFR 60.4(a), (b), (d) 40 CFR 60.7(a) 40 CFR 60.14(e) 40 CFR 60.19 40 CFR 60.52Da 40 CFR 60.48c(a)	For sources subject to 40 CFR 60.4, 40 CFR 60.7, 40 CFR 60.19, 40 CFR 60.52Da and 40 CFR 60.48c(a), submit the following: • Notification of commencement of construction or reconstruction of the facility (within 30 days); and • Notification of any physical or operational change to an existing facility which may increase the emission rate of any air pollutant to which a standard applies, unless that change is specifically exempted under 40 CFR 60.14(e) (within 60 days or as soon as the change commenced). Send copies of the notifications to the Director, Air Division, Region IX of the EPA. Also send a copy of the notifications to the Control Officer.	Timely submittal of notifications, maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
All activities, processes, and emission units (i.e., facility-wide operations) (cont'd)	Rule 210 Rule 371 40 CFR 75, Subpart G	In addition to the reports filed in accordance with 40 CFR 75, Subpart G, electronically report to EPA the data and information as required by 40 CFR 75.64 on a quarterly basis. Include facility data, unit emission data, monitoring data, control equipment data, monitoring plans and quality assurance data and results in the quarterly submittals.	Timely submittal of reports, maintenance of records.
	Rule 210 §305.1 Rule 210 §302.1 SIP Rule 32 40 CFR 60.7 40 CFR 60.19	Submit semiannual Monitoring Reports and Compliance Certifications (two separate documents with each document requiring a signed certification statement by the Responsible Official) including all required and necessary information.	Timely submittal of reports, maintenance of records.
	Rule 270 §301.1 Rule 210 §302.1 SIP Rule 27	Submit separate test protocols for each performance test to the MCAQD for review and approval at least 30 days prior to each performance test.	Timely submittal of protocols, maintenance of records.
	Rule 270 §301.1 Rule 210 §302.1 SIP Rule 27	Complete and submit separate test reports for each performance test to the MCAQD within 45 days after the completion of testing.	Timely submittal of reports, maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Combined Cycle System 1 (i.e., Combustion Turbine 1 and Duct Burner 1), Combined Cycle System 2 (i.e., Combustion Turbine 2 and Duct Burner 2)	Rule 240 §308.1(a), (d), and (e)	On a 12-month rolling basis, limit emissions from each combined cycle system to the following: • $SO_2 \leq 19.8$ tpy • $NO_X \leq 121.1$ tpy • CO ≤ 438.1 tpy • $PM_{10} \leq 99.9$ tpy • VOC ≤ 61.6 tpy	Calculation of emissions on a 12-month rolling basis.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Combined Cycle System 1 (i.e., Combustion Turbine 1 and Duct Burner 1), Combined Cycle System 2 (i.e., Combustion Turbine 2 and Duct Burner 2) (cont'd)	Rule 240 §308.1(a), (d), and (e) 40 CFR 60.43Da(b), (g) 40 CFR 60.333 Rule 360 §301 Rule 241 §301.1	When operating in conditions other than startup, shutdown, tuning, and testing, on an hourly basis, limit emissions from each the Combustion Turbine 1 and Combustion Turbine 2 (with Duct Burners 1 and 2 off) to the following: • $SO_2 \leq 4.00$ lb/hr • $NO_X \leq 20.2$ lb/hr • CO ≤ 34.0 lb/hr • $PM_{10} \leq 20.0$ lb/hr • VOC ≤ 3.0 lb/hr When operating in conditions other than startup, shutdown, tuning, and testing, on an hourly basis, limit emissions from each the Combustion Turbine 1 and Combustion Turbine 2 (with Duct Burners 1 and 2 on) to the following: • $SO_2 \leq 5.25$ lb/hr • $NO_X \leq 24.0$ lb/hr • CO ≤ 62.0 lb/hr • $PM_{10} \leq 24.0$ lb/hr • VOC ≤ 12.8 lb/hr	Performance of EPA Reference Method Tests.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Combined Cycle System 1 (i.e., Combustion Turbine 1 and Duct Burner 1), Combined Cycle System 2 (i.e., Combustion Turbine 2 and Duct Burner 2) (cont'd)	Rule 240 §308.1(a), (d), and (e)	During periods of startup, tuning, and testing, limit emissions from the Combined Cycle System 1 (i.e., Combustion Turbine 1 and Duct Burner 1) plus emissions from the Combined Cycle System 2 (i.e., Combustion Turbine 2 and Duct Burner 2) to the following: • $NO_X \leq 799.9$ lb/event • CO ≤ 2,484.0 lb/event • CO ≤ 2,520 lb/hr • VOC ≤ 142.0 lb/event During periods shutdown, limit emissions from the Combined Cycle System 1 (i.e., Combustion Turbine 1 and Duct Burner 1) plus emissions from the Combined Cycle System 2 (i.e., Combustion Turbine 2 and Duct Burner 2) to the following: • $NO_X \leq 124.0$ lb/event • CO ≤ 712.0 lb/event • VOC ≤ 44.0 lb/event	Performance of EPA Reference Method Tests.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Combined Cycle System 1 (i.e., Combustion Turbine 1 and Duct Burner 1), Combined Cycle System 2 (i.e., Combustion Turbine 2 and Duct Burner 2) (cont'd)	Rule 240 §308.1(a), (d), and (e) Rule 241 §301.1 Rule 360 §301 40 CFR 60.44Da(d)(1)	Limit emissions from each combined cycle system to the following: • $NO_X \leq 2.5$ ppm (3-hr rolling average) • $NO_X \leq 1.6$ lb/MWh • CO ≤ 20 ppm with Duct Burners 1 and 2 on (3-hr rolling average) • CO ≤ 10 ppm with Duct Burners 1 and 2 off (3-hr rolling average) • VOC ≤ 4.8 ppm with Duct Burners 1 and 2 on (3-hr rolling average) • VOC ≤ 1.4 ppm with Duct Burners 1 and 2 off (3-hr rolling average) • $NH_3 \leq 10$ ppm (24-hr rolling average)	Performance of EPA Reference Method Tests.
	Rule 210 §302.1(c)(1)	Operate and maintain an SCR system as part of each combined cycle system. At all times comply with the most recently submitted version of the Operations and Maintenance (O&M) Plan for each required SCR system.	Proper operation of the SCR system, maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Combined Cycle System 1 (i.e., Combustion Turbine 1 and Duct Burner 1), Combined Cycle System 2 (i.e., Combustion Turbine 2 and Duct Burner 2) (cont'd)	Rule 210 §302.1(c)(1)	Design the combined cycle system so they will not inject ammonia into the SCR system when the inlet temperature to the catalyst is less than the Minimum Catalyst Temperature to be established as part of the O&M Plans.	Proper design, maintenance of records.
	Rule 210 §302.1(c)(1)	Limit the total hours of tuning and testing for the two combined cycle systems to no more than 60 hours per calendar year. Any portion of a clock hour in which tuning and testing occurred counts toward the annual limit of 60 hours per year.	Maintenance of records.
	Rule 210 §302.1(c)(1)	Provide notification to the Control Officer at least one hour prior to conducting tuning and testing via phone, fax, or email.	Timely submittal of notifications, maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Combined Cycle System 1 (i.e., Combustion Turbine 1 and Duct Burner 1), Combined Cycle System 2 (i.e., Combustion Turbine 2 and Duct Burner 2) (cont'd)	Rule 360 §301.5 40 CFR 60.11(d)	At all times, including periods of startup, shutdown, and malfunction, maintain and operate any affected facility including associated air pollution control equipment to the extent practicable in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Control Officer which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures and inspection of the source.	Maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Combined Cycle System 1 (i.e., Combustion Turbine 1 and Duct Burner 1), Combined Cycle System 2 (i.e., Combustion Turbine 2 and Duct Burner 2) (cont'd)	Rule 210 §302.1(c)(1)	Monitor hourly and record the following: • Hours of operation and operating mode) of each combined cycle system; • Combined cycle system exhaust temperature prior to entering the SCR system; • Amount of natural gas combusted in each of the combined cycle systems; • Electrical energy output of each combined cycle system.	Maintenance of records.
	Rule 210 §302.1(c)(2) Rule 360 §301.3 40 CFR 60, Subpart Da 40 CFR 75	Calibrate, certify, and operate a CEMS for each combined cycle system exhaust stack to continuously measure CO, NO_X, and oxygen content of the exhaust stream. Record hourly average, rolling three-hour, and rolling 24-hour average values.	Operation of CEMS, maintenance of records.
	Rule 210 §302.1(c)(2) 40 CFR 75	Calibrate, certify, and operate natural gas fuel flow meters on each fuel line to monitor the unit-specific fuel flow to each combined cycle system.	Operation of flow meters, maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Combined Cycle System 1 (i.e., Combustion Turbine 1 and Duct Burner 1), Combined Cycle System 2 (i.e., Combustion Turbine 2 and Duct Burner 2) (cont'd)	Rule 360 40 CFR 75, Appendix D	Monitor for compliance with the fuel sulfur content limits in accordance with 40 CFR 75 Appendix D, Section 2.3.1.4.	Maintenance of records.
	Rule 371 40 CFR 75	Obtain and record the Gross Caloric Value of the natural gas used, as required by 40 CFR Part 75, Appendix D at least as frequently as required by 40 CFR Part 75, Appendix D and Appendix G.	Maintenance of records.
	Rule 210 §302.1(c)(1)	Certify and operate flow meters on each SCR system to measure the ammonia injection rate. Conduct sampling using a data acquisition system at a frequency of no less than once every 15 minutes and averaged into rolling 24-hour periods.	Operation of flow meters, maintenance of records.
	Rule 360 §301 40 CFR 60.50Da	Maintain records on site of the electrical energy output of each combined cycle system for each hour of operation.	Maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Combined Cycle System 1 (i.e., Combustion Turbine 1 and Duct Burner 1), Combined Cycle System 2 (i.e., Combustion Turbine 2 and Duct Burner 2) (cont'd)	Rule 210 §302.1(c)(2) SIP Rule 31	Take a visual emission observation of the stack emissions from each combined cycle system during each week of operation that the equipment was used more than 10 hours. If emissions are visible, obtain an opacity reading conducted by a certified reader. Take this reading within three operating days of the visible emission and taken thereafter weekly for each week when operations occur until there are no visible emissions. If the condition causing the visible emissions is eliminated before three days have passed, and no emissions are visible, it is not required to conduct the certified reading.	Visible emission monitoring; performance of EPA Reference Method 9 Test (if necessary).
CEMS Systems	Rule 210 §302.1(c)(1) Rule 360 §301 40 CFR 60, Sub. Da, GG 40 CFR 75, Sub. A, B, C, Appx A, Appx B	Design, install, operate, and quality assure according to 40 CFR 60 and 40 CFR 75. Follow the specifications contained in Section 2.1.5.1 of 40 CFR 75, Appendix D for the fuel flow monitor.	Proper design, maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
CEMS Systems (cont'd)	Rule 210 §302.1(c)(1) Rule 360 §301 40 CFR 60, Sub. Da, GG 40 CFR 75, Sub. A, B, C, Appx A, Appx B	Operate the CEMS and monitor unit emissions at all times that the combined cycle systems combust any fuel except during periods of calibration, quality assurance, preventive maintenance, repair, back-ups of data from the data acquisition and handling system, or recertification. Record and report malfunctions as required by 40 CFR Part 60 and Part 75	Proper operation, maintenance of records.
	Rule 210 §302.1(c)(1) Rule 360 §301 40 CFR 60, Sub. Da, GG 40 CFR 75, Sub. A, B, C, Appx A, Appx B	Obtain valid data for at least 75 percent of the operating hours in at least 22 of every 30 successive combustion turbine system operating days defined as a 24-hour period beginning at 12:01 AM and ending at 12:00 midnight during which natural gas is combusted in the combustion turbine and/or the duct burner at any time during the 24-hour period for any purpose.	Maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
CEMS Systems (cont'd)	Rule 210 §302.1(c)(1) Rule 360 §301 40 CFR 60, Sub. Da, GG 40 CFR 75, Sub. A, B, C, Appx A, Appx B	Submit an approvable O&M plan to the MCAQD for each CEMS system specifying the applicable operating parameters necessary to ensure continuous and accurate emissions monitoring. Comply with the most recently submitted O&M plan at all times.	Timely submittal of O&M plan, maintenance of records.
	Rule 210 §302.1(c)(1) Rule 360 §301 40 CFR 60, Sub. Da, GG 40 CFR 75, Sub. A, B, C, Appx A, Appx B	Submit an approvable Quality Assurance Plan (QAP) to the MCAQD for each CEMS system. Comply with the most recently submitted QAP at all times.	Timely submittal of QAP, maintenance of records.
	Rule 210 §302.1(c)(1) Rule 360 §301 40 CFR 60, Sub. Da, GG 40 CFR 75, Sub. A, B, C, Appx A, Appx B	Conduct the following in accordance with 40 CFR 60 and 40 CFR 75 requirements: • RATA and bias checks (at least annually); • Linearity checks or cylinder gas audits (CGA); and • Calibration error and drift checks. Ensure that all calibration gases (including zero gases) are certified and current at all times.	Timely checks, maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
CEMS Systems (cont'd)	Rule 210 §302.1(c)(1) Rule 360 §301 40 CFR 60, Sub. Da, GG 40 CFR 75, Sub. A, B, C, Appx A, Appx B	Re-calibrate any CEMS after any maintenance activity that could affect the system calibration and re-certify as required by and within the time periods required by 40 CFR 75.20(b) whenever a replacement, modification, or change is made that may significantly affect the ability of the system to accurately measure or record emissions.	Proper calibration and certification.
	Rule 210 §302.1(c)(1) Rule 360 §301 40 CFR 60, Sub. Da, GG 40 CFR 75, Sub. A, B, C, Appx A, Appx B	Develop and implement monthly, quarterly, and annual maintenance checklists (established as part of the O&M and QA Plans) to ensure proper operation and accuracy of the CEMS.	Maintenance of records.
	Rule 210 §302.1(c)(1) Rule 360 §301 40 CFR 60, Sub. Da, GG 40 CFR 75, Sub. A, B, C, Appx A, Appx B	Maintain records of all certifications, calibrations, testing, maintenance (including completed maintenance checklists), and repairs made to the CEMS.	Maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
CEMS Systems (cont'd)	Rule 210 §302.1(d) Rule 360 Rule 371 40 CFR 75, Subpart F	Maintain a file (recorded in a permanent form for at least five years) of CEMS emission records; operating parameter records; CEMS performance evaluations; CEMS or monitoring device calibration checks; adjustments and maintenance performed on these systems or devices; and any other information required by 40 CFR Part 75 Subpart F.	Maintenance of records.
	Rule 210 §302.1(d)	Maintain records on site of the data related to the emission limits, calibrations, quality assurance, performance demonstrations, and certifications for the reporting period.	Maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
CEMS Systems (cont'd)	Rule 200 §309 Rule 210 §302.1(c)(2), (3) Rule 210 §302 Rule 270 40 CFR 60.8 40 CFR 60.48a(b) 40 CFR 60.50Da 40 CFR 60.50.Da(f) 40 CFR 60.335 (a), (b) 40 CFR 60, Appendix F	Perform the following tests as required by 40 CFR 60, 40 CFR 75, and the MCAQD: • NO_X - Relative Accuracy Test Audit (RATA) testing; • CO - RATA testing; • PM_{10} – Method 5 or 201A/202 performance test (sampling time of at least 120 minutes and 1.70 dscm (60 dscf)); • VOC – Method 25A and 18 performance test; and • NH_3 - Method CTM-027 or Bay Area Air Quality Management District Source Test Procedure ST-1B.	Performance of tests using proper procedures including EPA Reference Method Tests.
	Rule 210 §302 Rule 270	Record the combustion turbine generator output, HRSG steam production rates, steam turbine generator output, NO_X concentration, CO concentration, SCR inlet NO_X concentration, combustion turbine fuel flow rate, duct burner fuel flow rate, SCR inlet temperature and ammonia injection rate, if applicable, during the performance tests.	Maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
CEMS Systems (cont'd)	Rule 210 §302.1 Rule 270 §403 40 CFR 60.8 40 CFR 64.4(c)	Record and report with the final test report the CO concentration collected by the CO CEMS during the VOC performance test.	Maintenance of records.
Combustion Turbine 1, Combustion Turbine 2	Rule 240 §308.1(a), (d), and (e)	Limit emissions from each combustion turbine to the following: • PM_{10} filterable only ≤ 9 lb/hr (3-hr average) • PM_{10} filterable plus condensable ≤ 24.0 lb/hr (3-hr average)	Performance of EPA Reference Method Tests.
	Rule 200 §310	Limit the fuel source to only pipeline natural gas.	Maintenance of records.
	Rule 322 §503 SIP Rule 32	Maintain records on site of the hours of operation and amount of fuel burned each hour for each combustion turbine.	Maintenance of records.
Duct Burner 1, Duct Burner 2	Rule 360 §301 40 CFR 60.42Da(a)	Limit emissions from each the Duct Burner 1 and Duct Burner 2 to the following: • PM_{10} ≤ 0.03 lb/MMBtu	Performance of EPA Reference Method Tests.
	Rule 200 §310	Limit the fuel source to only pipeline natural gas.	Maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Duct Burner 1, Duct Burner 2 (cont'd)	Rule 360 §301.3 40 CFR 60.41Da 40 CFR 60.51Da	Report NO_X concentrations and all supporting information to the EPA and the Control Officer semiannually for each six month period, post marked no later than the 30th day following the end of each six-month period as required by 40 CFR 60.7(c) and 40 CFR 60.7(d).	Timely submittal of reports, maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Duct Burner 1, Duct Burner 2 (cont'd)	Rule 360 §301.1 40 CFR 60.7(c) and (d)	Submit an excess emissions report for NO_X emissions, a NO_X CEMS performance report as required by 40 CFR 60.7(c), and the summary report form required by 40 CFR 60.7(d). Prepare the reports in accordance with 40 CFR 60.7(c)(1), (2), (3) and 40 CFR 60.7(d). When no excess emissions have occurred or the CEMS have not been inoperative, repaired, or adjusted, state such information in the reports. If the total duration of excess emissions for the reporting period is less than 1 percent of the total operating time for the reporting period and the CEMS downtime for the reporting period is less than 5 percent of the total operating time for the reporting period, use only the summary report form specified in 40 CFR 60.7(d) and no excess emissions report is required.	Timely submittal of reports, maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Auxiliary Boiler	Rule 240 §308.1(a), (d), and (e)	On a 12-month rolling basis, limit emissions to the following: • $SO_2 \leq 0.2$ tpy • $NO_X \leq 3.3$ tpy • CO ≤ 14.1 tpy • $PM_{10} \leq 0.9$ tpy • VOC ≤ 1.5 tpy	Calculation of emissions on a 12-month rolling basis.
	Rule 240 §308.1(a), (d), and (e)	On an hourly basis, limit emissions to the following: • $SO_2 \leq 0.08$ lb/hr • $NO_X \leq 3.11$ lb/hr • CO ≤ 4.95 lb/hr • $PM_{10} \leq 0.33$ lb/hr • VOC ≤ 0.53 lb/hr	Performance of EPA Reference Method Tests.
	Rule 240 §308.1(a), (d), and (e)	Limit emissions to the following: • $NO_X \leq 0.035$ lb/MMBtu • CO ≤ 0.150 lb/MMBtu	Performance of EPA Reference Method Tests.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Auxiliary Boiler (cont'd)	Rule 240 §308.1(a), (d), and (e)	Limit operation to no more than 6,000 hours per rolling 12-month period.	Calculation of hours of operation on a 12-month rolling basis.
	Rule 200 §310	Limit the fuel source to only pipeline natural gas.	Maintenance of records.
	Rule 360 §301.5 40 CFR 60.11(d)	At all times, including periods of startup, shutdown, and malfunction, maintain and operate any affected facility including associated air pollution control equipment to the extent practicable in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Control Officer which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures and inspection of the source.	Maintenance of records.
	Rule 210 §302.1(c)(1) Rule 360 §301.5 40 CFR 60.48c(g)	Monitor and record the hours of operation, calculate monthly the 12-month total hours of operation, and record the monthly amount of natural gas combusted.	Maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Auxiliary Boiler (cont'd)	Rule 371 40 CFR 75	Obtain and record the Gross Caloric Value of the natural gas used, as required by 40 CFR Part 75, Appendix D at least as frequently as required by 40 CFR Part 75, Appendix D and Appendix G.	Maintenance of records.
	Rule 210 §302.1(d) SIP Rule 32	Maintain records on site of the hours of operation and amount of fuel burned.	Maintenance of records.
Engine Associated with the Fire Water Pump (emergency), Engine Associated with the Backup Generator (emergency)	A.A.C. R18-2-719.B and A.A.C. R18-2-719.C	$PM \leq 1.02\ Q^{0.769}$, when $Q \leq 4{,}200$ MMBtu/hr $PM \leq 17.0\ Q^{0.432}$, when $Q > 4{,}200$ MMBtu/hr (where PM = maximum emission rate in lb/hour, Q = heat input in MMBtu/hr) The total heat input of all operating fuel-burning units on a plant or premises is used for determining the maximum allowable amount of PM which may be emitted.	Engineering evaluation; operation of equipment in a manner as to limit air pollution.
	Rule 300 §302.2	When operating for safety reasons, opacity (other than uncombined water) in excess of what is required by Rule 300 §301 may be discharged. Any discharge of air contaminants in excess of the opacity limit should not contribute to a violation of the national ambient air quality standard.	Visible emission monitoring; performance of EPA Reference Method 9 Test.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Engine Associated with the Fire Water Pump (emergency), Engine Associated with the Backup Generator (emergency) (cont'd)	Rule 320 §305 SIP Rule 32H 40 CFR 80.510(b)	Limit the fuel source to only commercially available diesel fuel with sulfur content of 0.0015 percent by weight or less.	Use of ultra-low sulfur fuel; fuel supplier certifications; maintenance of records.
	Rule 324 §104.5 Rule 324 §205	Limit the operation of the emergency engines to no more than 100 hours each per calendar year for the purposes of maintenance checks and readiness testing.	Maintenance of records.
	Rule 220 §302.2	Limit the total hours of operation of the emergency engines to no more than 500 hours each per any twelve consecutive months including the 100 hours each per calendar year listed above.	Maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Engine Associated with the Fire Water Pump (emergency), Engine Associated with the Backup Generator (emergency) (cont'd)	Rule 324 §104	Do not use the emergency engines for peak shaving. Use the emergency engines for the following purposes only: • Power when normal power service fails from the serving utility or if onsite electrical transmission or onsite power generation equipment fails; • Reliability-related activities such as engine readiness, calibration, or maintenance or to prevent the occurrence of an unsafe condition during electrical system maintenance as long as the total number of hours of the operation does not exceed 100 hours per calendar year per engine as evidenced by an installed non-resettable hour meter; and • To operate standby emergency water pumps for fire control that activate when sensors detect low water pressure.	Maintenance of records.
	Rule 324 §301.1	Use fuel that contains no more than 0.05% sulfur by weight, alone or in combination with other fuels.	Use of ultra-low sulfur fuel; fuel supplier certifications; maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Engine Associated with the Fire Water Pump (emergency), Engine Associated with the Backup Generator (emergency) (cont'd)	Rule 324 §502	Maintain the following records for a period of at least five years from the date of the records and make them available to the Control Officer upon request: • An initial one time entry listing the particular engine combustion type (compression or spark-ignition or rich or lean burn); manufacturer; model designation, rated brake horsepower, serial number and where the engine is located on the site. • Monthly rolling twelve month total of hours of operation, including hours of operation for testing, reliability and maintenance. • Fuel type and sulfur content of fuel. • An explanation for the use of the engine if it is used as an emergency engine.	Maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Engine Associated with the Fire Water Pump (emergency), Engine Associated with the Backup Generator (emergency) (cont'd)	Rule 220 §302.7	Maintain an onsite copy of the manufacturer's written instructions, or any procedures developed independently and make it available to MCAQD upon request.	Maintenance of records.
	Rule 210 §302.1(c)(2)	Record the actual hours of operation and the reason for operation of the engines and the nature of the emergency or maintenance check that caused the engines to be used. Calculate monthly the 12-month total hours of operation.	Maintenance of records.
	Rule 210 §302.1(d) SIP Rule 32	Maintain records on site of the hours of operation of each engine.	Maintenance of records.
	Rule 220 §302.4	Refrain from operating the engines unless the run time meters are installed and working properly.	Installation run time meters, maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Engine Associated with the Fire Water Pump (emergency), Engine Associated with the Backup Generator (emergency) (cont'd)	Rule 370 §302.80 40 CFR 63.6603(a) (Table 2d, Entry 4)	Perform the following required maintenance: • Change oil and filter every 500 hours of operation or annually, whichever comes first; • Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first, and replace as necessary; • Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.	Timely performance of required maintenance; maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Engine Associated with the Fire Water Pump (emergency), Engine Associated with the Backup Generator (emergency) (cont'd)	Rule 370 §302.80 40 CFR 63.6603(a) (Table 2d, Footnote 2)	If an emergency engine is operating during an emergency and it is not possible to shut down the engine in order to perform the management practice requirements on the schedule required in Table 2d, or if performing the management practice on the required schedule would otherwise pose an unacceptable risk under federal, state, or local law, the management practice can be delayed until the emergency is over or the unacceptable risk under federal, state, or local law has abated. The management practice should be performed as soon as practicable after the emergency has ended or the unacceptable risk under federal, state, or local law has abated. Sources must report any failure to perform the management practice on the schedule required and the federal, state or local law under which the risk was deemed unacceptable.	Maintenance of records.
	Rule 370 §302.80 40 CFR 63.6605(a)	Be in compliance with the emission limitations, operating limitations, and other requirements at all times.	Maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Engine Associated with the Fire Water Pump (emergency), Engine Associated with the Backup Generator (emergency) (cont'd)	Rule 370 §302.80 40 CFR 63.6605(b)	Operate and maintain each engine, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Control Officer which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.	Maintenance of records.
	Rule 370 §302.80 40 CFR 63.6625(e)(3)	Operate and maintain the engine and any after-treatment control device (if any) in accordance with manufacturer's emission-related written instructions, or develop a maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions.	Maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Engine Associated with the Fire Water Pump (emergency), Engine Associated with the Backup Generator (emergency) (cont'd)	Rule 370 §302.80 40 CFR 63.6625(f)	Install a non-resettable hour meter if one is not already installed.	Installation of non-resettable hour meters, maintenance of records.
	Rule 370 §302.80 40 CFR 63.6625(h)	Minimize idle time of engine during startup and minimize startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes.	Maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Engine Associated with the Fire Water Pump (emergency), Engine Associated with the Backup Generator (emergency) (cont'd)	Rule 370 §302.80 40 CFR 63.6625(i)	Utilize an optional oil analysis program in order to extend the specified oil change requirements in 40 CFR 63.6603(a). The analysis must be performed at the same frequency specified for changing the oil and must at a minimum analyze the following parameters: • Total Base Number; • Viscosity; and • Percent water content. The condemning limits for these parameters are as follows: • Total Base Number is less than 30 percent of the Total Base Number of the oil when new; • Viscosity of the oil has changed by more than 20 percent from the viscosity of the oil when new; or • Percent water content (by volume) is greater than 0.5.	Performance of required oil change; maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Engine Associated with the Fire Water Pump (emergency), Engine Associated with the Backup Generator (emergency) (cont'd)	Rule 370 §302.80 40 CFR 63.6625(i) (cont'd)	If any of the condemning limits are exceeded, change the oil within 2 business days of receiving the results of the analysis. If the engine is not in operation when the results of the analysis are received, change the oil within 2 business days or before commencing operation, whichever is later. Keep records of the parameters that are analyzed as part of the program, the results of the analysis, and the oil changes for the engine. The analysis program must be part of the maintenance plan for the engine.	Performance of required oil change; maintenance of records.
	Rule 370 §302.80 40 CFR 63.6640(a) (Table 6, Entry 9)	Operate and maintain each engine in accordance with manufacturer's emission-related operation and maintenance instructions, or develop and follow a maintenance plan which must provide to the extent practicable for the maintenance and operation of the engines in a manner consistent with good air pollution control practice for minimizing emissions.	Maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Engine Associated with the Fire Water Pump (emergency), Engine Associated with the Backup Generator (emergency) (cont'd)	Rule 370 §302.80 40 CFR 63.6640(b)	Report each instance in which the requirements of 40 CFR 63.6603(a) were not met.	Submittal of reports; maintenance of records.
	Rule 370 §302.80 40 CFR 63.6650(f)	Report all deviations as defined in 40 CFR 63, Subpart ZZZZ along with the semiannual compliance certifications.	Submittal of reports; maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Engine Associated with the Fire Water Pump (emergency), Engine Associated with the Backup Generator (emergency) (cont'd)	Rule 370 §302.80 40 CFR 63.6655(a)(2) 40 CFR 63.6655(a)(4) 40 CFR 63.6655(a)(5)	Maintain records of the occurrence and duration of each malfunction of operation (*i.e.,* process equipment) or the air pollution control and monitoring equipment. Maintain records of all required maintenance performed on the air pollution control and monitoring equipment. Maintain records of actions taken during periods of malfunction to minimize emissions in accordance with 40 CFR 63.6605(b), including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation.	Maintenance of records.
	Rule 370 §302.80 40 CFR 63.6655(d)	Maintain records of required maintenance performed in accordance with 40 CFR 63.6603(a).	Maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Engine Associated with the Fire Water Pump (emergency), Engine Associated with the Backup Generator (emergency) (cont'd)	Rule 370 §302.80 40 CFR 63.6655(e)(2)	Maintain records of the maintenance conducted on the engine, and any after-treatment control device, in order to demonstrate that the engine was operated and maintained according to any developed maintenance plan.	Maintenance of records.
	Rule 370 §302.80 40 CFR 63.6655(f)	Maintain records of the hours of operation of the engine, recorded through the non-resettable hour meter. Document how many hours are spent for emergency operation, including what classified the operation as emergency, and how many hours are spent for non-emergency operation.	Maintenance of records.
	Rule 370 §302.80 40 CFR 63.6660(a) 40 CFR 63.6660(b) 40 CFR 63.6660(c)	Make and keep records in a form suitable and readily available for expeditious review. Keep records readily accessible in hard copy or electronic form for at least five years following the date of each occurrence, measurement, maintenance, corrective action, report, or record, in accordance with 40 CFR 63.10(b)(1).	Maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Wet Cooling Tower	Rule 240 §308.1(a), (d), and (e)	On a 12-month rolling basis, limit emissions to the following: • $PM_{10} \leq 18.2$ tpy	Calculation of emissions on a 12-month rolling basis.
	Rule 240 §308.1(a), (d), and (e)	Equip and maintain high efficiency drift eliminators certified by the cooling tower vendor to achieve less than 0.001 percent drift.	Installation of drift eliminators, maintenance of records.
	Rule 240 §308.1(a), (d), and (e)	Limit the total dissolved solids (TDS) content of the cooling water to no more than 19,058 milligrams per liter (mg/l).	Maintenance of records.
	Rule 210 §302.1(c)(2)	Inspect the drift eliminators monthly for proper installation, maintenance, and operation. Record the results of the inspection in a facility log.	Timely inspection and maintenance of records.

Table 4.1 Applicable Regulatory Requirements and the Methods Used for Demonstrating Compliance

Equipment/Process	Regulatory Citation for Applicable Requirements	Description of Requirements	Methods Used to Demonstrate Compliance
Wet Cooling Tower (cont'd)	Rule 210 §302.1(c)	Sample the cooling water monthly to determine the multiplication factor used to determine TDS. Monitor and record the conductivity of the water daily and calculate cooling tower water TDS from the conductivity value using the most recently obtained multiplication factor from the monthly water TDS analysis. The conductivity readings of the cooling water do not need to be taken on a particular day if the cooling tower fans have not been in operation during that day.	EPA approved Test Method 2540C from the Standard Methods for the Analysis of Water or other EPA approved method approved by the Control Officer, maintenance of records.
	Rule 210 §302.1(d)	Maintain on site the cooling tower inspection log and results of TDS monitoring	Maintenance of records.

5 VOLUNTARY LIMITS AND PROPOSED EXEMPTIONS

Permit #V99-014 currently includes only one limitation voluntarily accepted by the AVEF. The limitation is incorporated into Condition 19.D.2 of Permit #V99-014 and concerns the hours of operation of the following equipment:

- Engine Associated with the Fire Water Pump (emergency); and
- Engine Associated with the Backup Generator (emergency).

Condition 19.D.2 of Permit #V99-014 states that the AVEF "shall limit the total hours of operation of the emergency engine(s) to no more than 500 hours each per any twelve consecutive months" including the allowed 100 hours each per calendar year for the purposes of maintenance checks and readiness testing.

The AVEF does not propose any other voluntarily accepted limitations as part of this Title V Renewal Application. Additionally, the AVEF does not propose any exemptions from otherwise applicable requirements.

6 MISCELLANEOUS INFORMATION

6.1 PROCESS RATES OF THE ENTIRE PLANT

The overall process rate of the AVEF is dependent on if the facility is operating in simple-cycle or combined-cycle mode and if the duct burners are tuned on or off. When operating in simple-cycle mode, each combustion turbine has a power output of 168 MW (total of 336 MW). In combined-cycle mode, the total plant output increases to about 510 MW without duct firing or 580 MW with duct firing and inlet air chilling.

6.2 PROCESS RATES OF EACH EMISSION UNIT

The maximum annual and hourly process rates for each piece of equipment that generates air emissions is presented in Table 3.1 of Section 3.

6.3 FUEL USE

A summary of all fuel burning equipment at the AVEF that requires a permit is presented in Table 6.1. For each piece of fuel burning equipment, the type and quantity of fuels that will be used on an annual and hourly basis, the percent that will be used for process heat, the higher heating values of the fuels, and the potential sulfur and ash contents of the fuel are also included in Table 6.1. The combustion turbines are fueled entirely by pipeline natural gas, which is currently mainly supplied by El Paso Natural Gas Company.

6.4 RAW MATERIAL USE

Other than the natural gas and diesel usage described in Section 6.3, water is the only other significant raw material that is used at the AVEF. Well water, treated by *reverse* osmosis/demineralization is used in the HRSGs. Water is also needed for the cooling tower process. The quantity of water used on a maximum hourly, monthly, quarterly, and maximum annual basis is not needed for determination and regulation of emissions or to comply with the Rules.

Table 6.1 Fuel Usage Information

Equipment Name	Fuel Type	Maximum Annual Fuel Use	Maximum Hourly Fuel Use	Percent Used for Process Heat	Higher Heating Value	Sulfur and Ash Content [a]
Combustion Turbine 1	Natural Gas	15,189 MMscf	1,733,870 scf	100%	1,004 Btu/scf	≤ 0.5 gr sulfur /100 dscf [b]
Duct Burner 1	Natural Gas	3,111 MMscf	355,179 scf	100%	1,004 Btu/scf	≤ 0.5 gr sulfur /100 dscf [b]
Combustion Turbine 2	Natural Gas	15,189 MMscf	1,733,870 scf	100%	1,004 Btu/scf	≤ 0.5 gr sulfur /100 dscf [b]
Duct Burner 2	Natural Gas	3,111 MMscf	355,179 scf	100%	1,004 Btu/scf	≤ 0.5 gr sulfur /100 dscf [b]
Auxiliary Boiler [c]	Natural Gas	197 MMscf	32,869 scf	100%	1,004 Btu/scf	≤ 0.5 gr sulfur /100 dscf [b]
Engine Associated with the Fire Water Pump [d]	Diesel	4,113 gallons	8.23 gallons	0%	137,000 Btu/gallon	≤ 0.0015% sulfur [e]

Table 6.1 Fuel Usage Information

Equipment Name	Fuel Type	Maximum Annual Fuel Use	Maximum Hourly Fuel Use	Percent Used for Process Heat	Higher Heating Value	Sulfur and Ash Content [a]
Engine Associated with the Backup Generator [d]	Diesel	19,109 gallons	38.22 gallons	0%	137,000 Btu/gallon	≤ 0.0015% sulfur [e]

[a] Ash content is negligible for both natural gas and diesel.

[b] The natural gas sulfur content is based on the definition of pipeline natural gas in Condition 10 of Permit #V99-014.

[c] Auxiliary Boiler annual gas usage based on 6,000 hours per year (Condition 19.B of Permit #V99-014).

[d] Diesel engines fuel usage based on 500 hours per year (Condition 19.D.2 of Permit #V99-014) and an average brake-specific fuel consumption value of 7,000 Btu/hp-hr.

[e] The diesel sulfur content is based on Condition 19.A.2 of Permit #V99-014.

The average hourly fuel use rate is not necessary for determining emissions or demonstrating compliance with Maricopa County Rules.

6.5 ANTICIPATED OPERATING SCHEDULES AND LIMITATIONS ON SOURCE OPERATIONS AND WORK PRACTICE STANDARDS AFFECTING EMISSIONS

The AVEF is capable of operating continuously (8,760 hours/year). Production by season is dependent on market demands, but is anticipated to be distributed fairly evenly throughout the year (i.e., approximately 25% of the annual production is expected in each the winter, spring, summer, and fall).

In accordance with Condition 19.D.2 of Permit #V99-014, operation of the engines associated with the emergency fire-water pump and back-up diesel generator are limited to 500 hours per year each. Furthermore, Condition 19.B of Permit #V99-014 limits the auxiliary boiler to 6,000 hours of operation per rolling 12-month period.

Additional operational limitations are typically due to regular maintenance outages. Other than regular maintenance, no additional limitations on source operations that might affect emissions are anticipated.

6.6 DEMONSTRATION OF COMPLIANCE WITH VOLUNTARY LIMITS

As described in Section 5, the only limitation voluntarily accepted by the AVEF is in regard to the hours of operation of the emergency engines. Condition 19.D.2 of Permit #V99-014 states that the AVEF "shall limit the total hours of operation of the emergency engine(s) to no more than 500 hours each per any twelve consecutive months" including the allowed 100 hours each per calendar year for the purposes of maintenance checks and readiness testing.

Compliance with the voluntary limit will continue to be demonstrated by recording the rolling twelve month total of the hours of operation of each engine on a monthly basis, including the hours of operation for testing, reliability, and maintenance purposes. This recordkeeping is required by Condition 20.V.1.b of Permit #V99-014. The hours of operation will continue to be tracked using the run time meters required by Condition 20.T of Permit #V99-014.

7 PROCESS AND CONTROL EQUIPMENT DETAILS

Each piece of process and control equipment operated at the AVEF that requires a permit is listed in Table 7.1 along with the corresponding information:

- Name;
- Make (if available);
- Model (if available);
- Serial Number (if available);
- Date of Manufacturer (if available);
- Size/Production Capacity; and
- Type.

Equipment that are not subject to a source-specific applicable requirements, do not have the potential to emit regulated air pollutants, are insignificant activities, or are trivial activities are not identified in Table 7.1. Further detailed information about insignificant activities at the AVEF is presented in Section 14.

Table 7.1 Description of Process and Control Equipment that Requires a Permit

Equipment Name	Make	Model	Serial Number	Date of Manufacture	Size/Production Capacity	Type
Combustion Turbine 1 with SCR	GE	7FA	297649	Commissioned: 6/17/2002	168 MW 1,740.805 MMBtu/hr	Natural Gas Turbine
Duct Burner 1	Coen	N/A	Job #: 40D-13638-1-000	10/2/2001	356.6 MMBtu/hr	Natural Gas Burner
Combustion Turbine 2 with SCR	GE	7FA	297650	Commissioned: 6/17/2002	168 MW 1,740.805 MMBtu/hr	Natural Gas Turbine
Duct Burner 2	Coen	N/A	Job #: 40D-13638-1-000	10/2/2001	356.6 MMBtu/hr	Natural Gas Burner
Auxiliary Boiler	Cleaver Brooks	CBLE-700-750	Job #: 893710-0-DS-4-SB-2	11/27/2001	33 MMBtu/hr	Natural Gas Boiler
Engine Associated with the Fire Water Pump (emergency)	Detroit Diesel	JU6H-UF50	PF6068T146953	May 2001	161 hp	Emergency Engine
Engine Associated with the Backup Generator (emergency)	Caterpillar	3412	3FZ02675	August 2001	748 hp	Emergency Engine
Wet Cooling Tower	PSI	CFD-545434-6I-36	Contract #: 893710	Commissioned: 6/17/2002	138,300 gal/min (6 cells @ 23,050 gal/min)	Cooling Tower

Table 7.1 Description of Process and Control Equipment that Requires a Permit

Equipment Name	Make	Model	Serial Number	Date of Manufacture	Size/Production Capacity	Type
Chiller Module 1	Baltimore Aircoil	3-331132A-QMV-4	N/A	2002	12,000 gal/min	Cooling Tower
Chiller Module 2	Baltimore Aircoil	3-331132A-QMV-4	N/A	2002	12,000 gal/min	Cooling Tower
Chiller Module 3	Baltimore Aircoil	3-331132A-QMV-4	N/A	2002	12,000 gal/min	Cooling Tower
Hydrochloric Acid Tank	Tankinetics	N/A	Job #: 893732-4-012	2001	6,000 gal (working volume)	Tank

Note:
N/A = Not Available

8 STACK INFORMATION

The stack information for each emission point at the AVEF is included on the Emission Source Form presented in Appendix A. The available stack information includes:

- Identification of the emission points;
- Description of the emission points;
- Universal Transverse Mercator (UTM) coordinates of the emission points;
- Height of the emission points above the ground;
- Height of the emission points above any structures;
- Exit diameter of the emission points;
- Exit gas velocity of the emission points; and
- Exit gas temperature of the emission points.

Other information including building and inside dimensions are not necessary for Title V Renewal Applications.

9 SITE DIAGRAMS

Site diagrams of the AVEF are presented in Figures 9.1 through 9.3. The site diagrams include the following information:

- Property boundaries;
- Adjacent streets and/or roads;
- Directional arrow;
- Elevation;
- Closest distance between equipment and the property boundary; and
- Equipment layout.

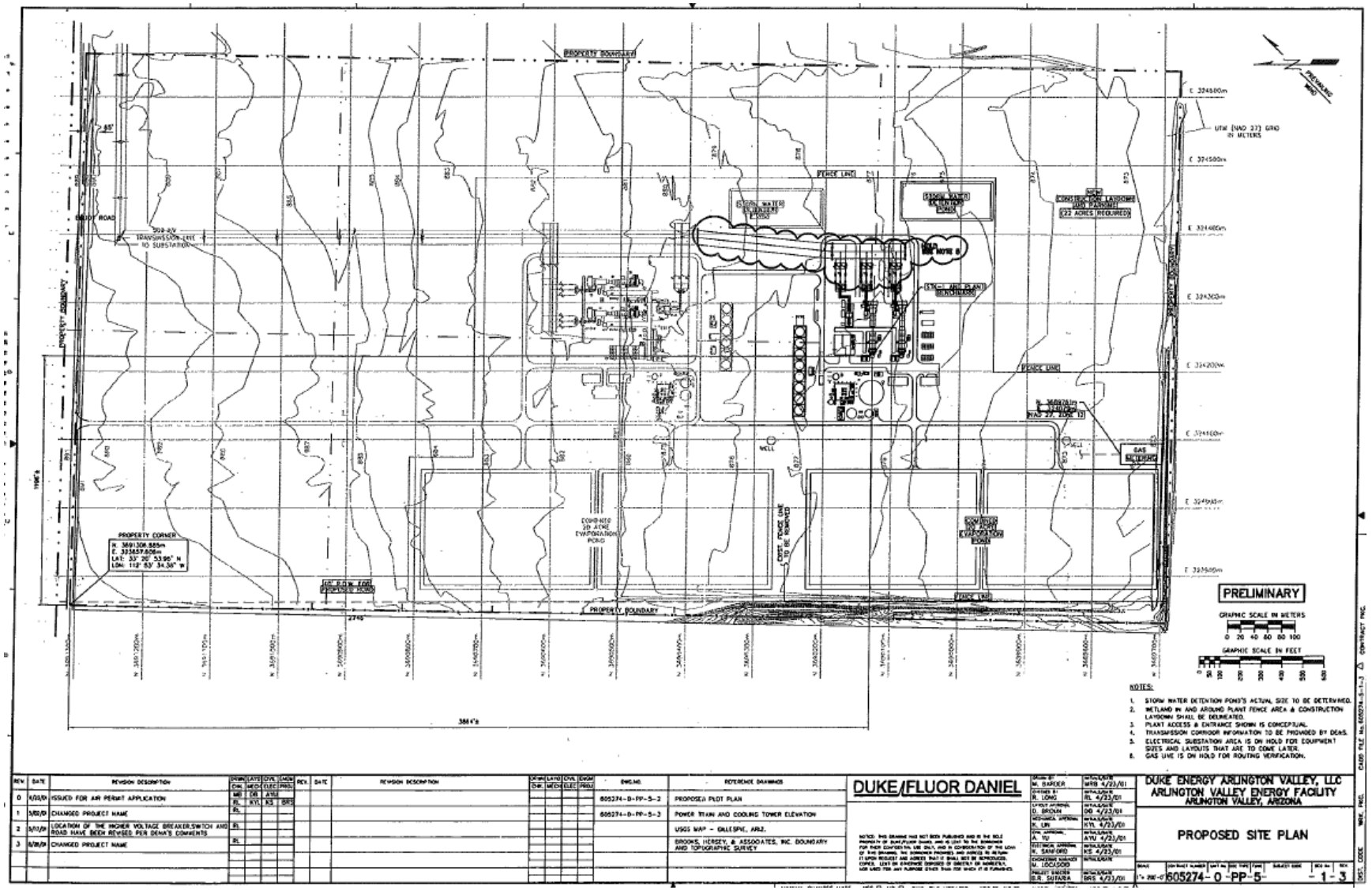


Figure 9.1 Site Plan of the AVEF

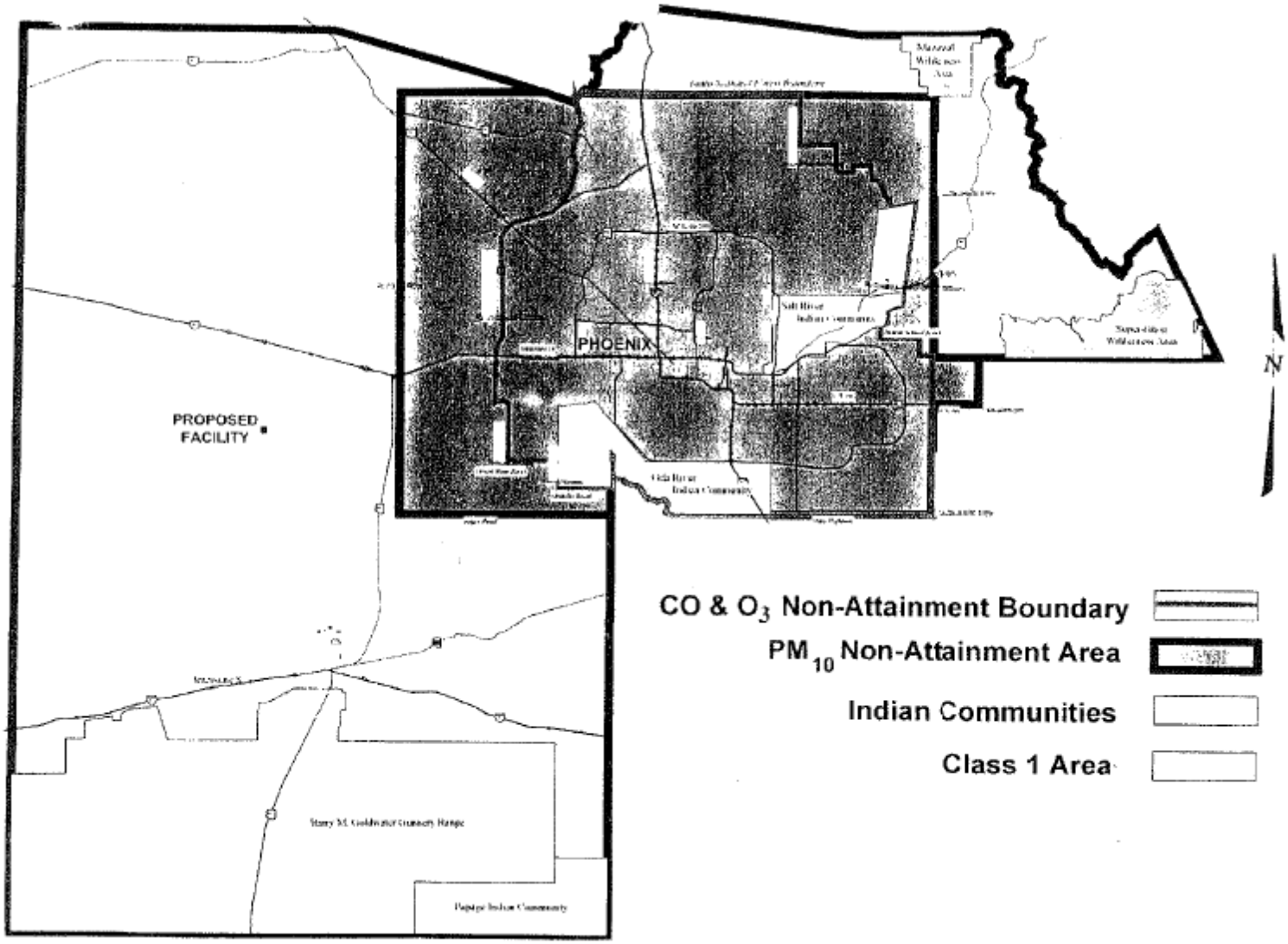


Figure 9.2 Regional Location Map of the AVEF

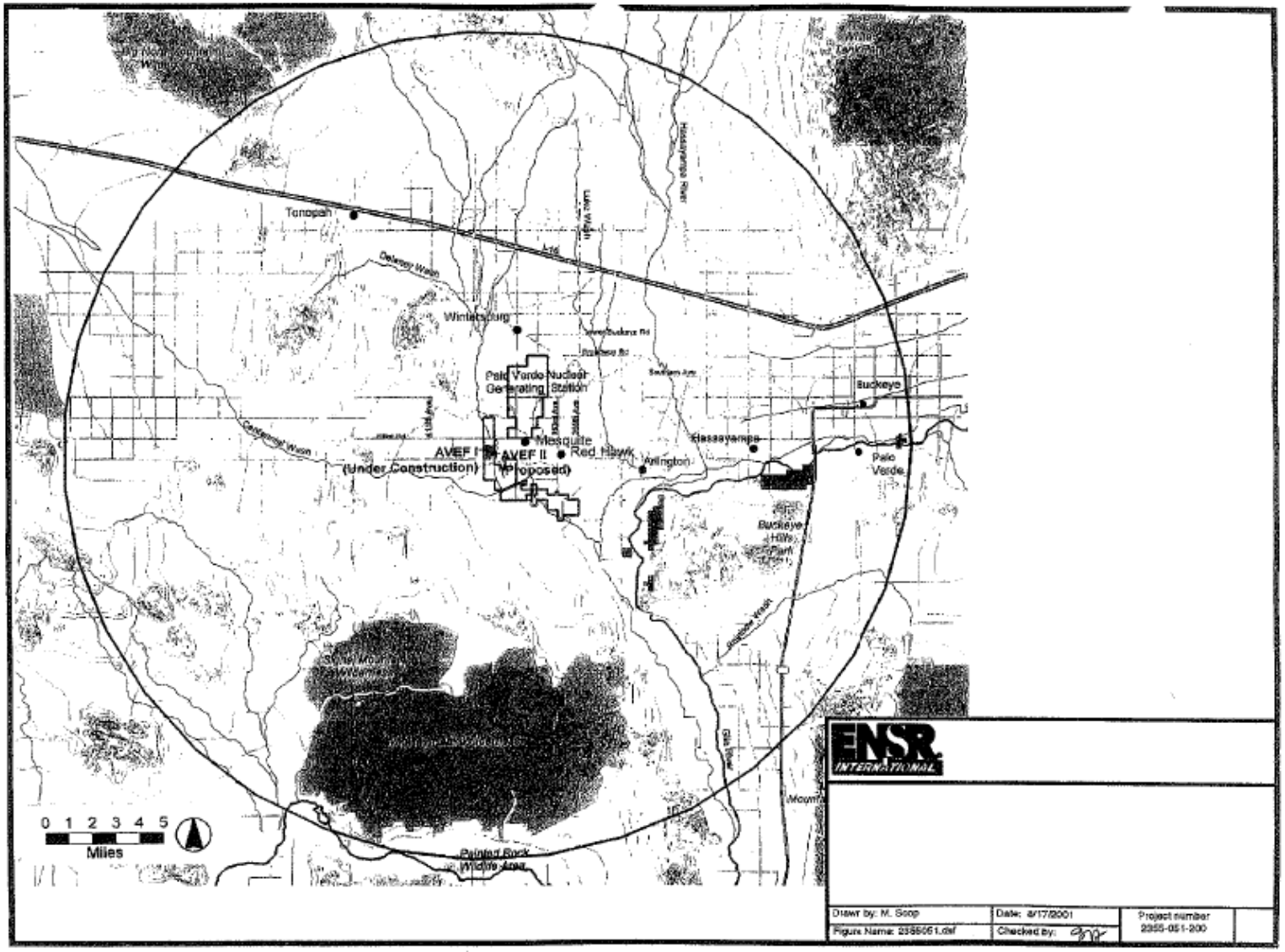


Figure 9.3 Site Location of the AVEF

10 AIR POLLUTION CONTROL INFORMATION

Air pollution control information is presented in Appendix A.

11 COMPLIANCE PLAN

The AVEF is not currently subject to a compliance plan, therefore this section is not applicable.

12 CAM ANALYSIS

Pursuant to 40 CFR Part 64.2(a), compliance assurance monitoring (CAM) applies to pollutant-specific emission units (PSEUs) located at a Title V major source if all of the criteria summarized below are met:

A. The PSEU is subject to an emission limitation or standard for the applicable regulated air pollutant (or surrogate thereof), other than an emission limitation or standard that is exempt under 40 CFR 64.2(b)(1);

B. The PSEU uses a control device (not including passive control measures that act to prevent pollutants from forming) to achieve compliance with any such emission limitation or standard; and

C. The PSEU has potential pre-control device emissions (i.e., PTE without consideration of emission reductions due to the use of pollution control devices) of the applicable regulated air pollutant that are equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a Title V major source.

PSEU is defined in 40 CFR Part 64 as "an emissions unit considered separately with respect to each regulated air pollutant." EPA notes in the preamble to the final CAM rule that the term "pollutant-specific emissions unit," defined in §64.1, is used in 40 CFR Part 64 to clarify that applicability for each pollutant is determined separately at each emission unit. For example, a coal-fired boiler emitting through a single stack could constitute several pollutant-specific emission units, such as for PM_{10}, SO_2, NO_X, and CO.

The PSEUs at the AVEF that could potentially be subject to CAM include:

- Combustion Turbines 1 and 2 (NO_X emissions controlled by SCR); and
- Wet Cooling Tower (PM_{10} emissions controlled by drift eliminators).

NO_X emissions from Combustion Turbines 1 and 2 are subject to monitoring under the acid rain program required by Title IV of the CAA Amendments of 1990. The facility will comply with the NO_X monitoring, recordkeeping and reporting requirements within 40 CFR 75, and thus, is exempt from CAM for the combustion turbines for NO_X according to 40 CFR 64.2(b)(1)(iii). Additionally, the AVEF is required by the Title V permit to monitor CO with a CEMS, so CO is also exempt from CAM (see the exemption in 40 CFR 64.2(b)(1)(vi)).

In the case of the Wet Cooling Tower, drift eliminators do not require continual adjustments, and hence would be classified as a "passive" rather than active control device. Therefore, this unit would not meet the applicability criteria of CAM.

13 INSIGNIFICANT ACTIVITIES

Operations at the AVEF include the following insignificant activities:

- Cooling tower water treatment system, including two sulfuric acid tanks;
- Plant sumps, sump pumps, and oil/water separator;
- Feed water treatment systems including:
    - One 19,500 gallon Demineralizer Regeneration Tank, storing sulfuric acid
    - One 68,000 gallon Neutralization Tank, storing a water/sodium sulfate solution
    - One 19,500 gallon Demineralizer Regeneration Tank, storing sodium hydroxide solution
- Plant and instrument air compressors and auxiliary equipment;
- Sanitary lift station;
- Sanitary sewer vents;
- Knock out drum and filter/separator;
- Steam and water sampling systems;
- Deaerator vent;
- Support facilities for the SCR;
    - Aqueous ammonia (ammonium hydroxide, < 20% solution) off-loading facility
    - 21,000 gallon aqueous ammonia tank (16 feet tall x 15 feet diameter).
- A closed loop auxiliary cooling system consisting of pumps, expansion tank, and heat exchangers;
- Inlet chilling system;
- 350 gallon diesel fuel storage tank (horizontal tank, 6.5 feet long x 3 feet 2 inches diameter) for the Engine Associated with the Fire Water Pump (emergency);
- 1,640 gallon diesel fuel storage tank (horizontal tank, 12 feet long x 5 feet diameter) for the Engine Associated with the Backup Generator (emergency);
- Abrasive blasting machine;
- Cold degreaser;
- Wipe cleaning;
- Building HVAC exhaust vents;
- Turbine compartment ventilation exhaust vents;

- Turbine lube oil vapor extractors and lube oil mist eliminator vents;
- Steam drum safety relief valve vents;
- Building air conditioner units;
- Various steam release vents;
- Welding equipment;
- Lab hood vents;
- Hydrazine storage tank vent;
- Fuel purge vents;
- Condenser vacuum pump vents;
- Acetylene, butane, and propane torches;
- Landscaping, building maintenance, or janitorial activities; and
- Additional Activities listed in Appendix D and Appendix E of the Maricopa County Adopted Rules

The sulfuric acid tanks associated with the cooling tower water treatment systems do not emit regulated air pollutants. To be thorough, emissions from these tanks were calculated using the EPA TANKS (version 4.0.9d) program. The output from the TANKS program is provided in Appendix F.

APPENDIX A COMPLIANCE CERTIFICATION AND STANDARD PERMIT APPLICATION FORM INCLUDING THE EMISSION SOURCE FORM

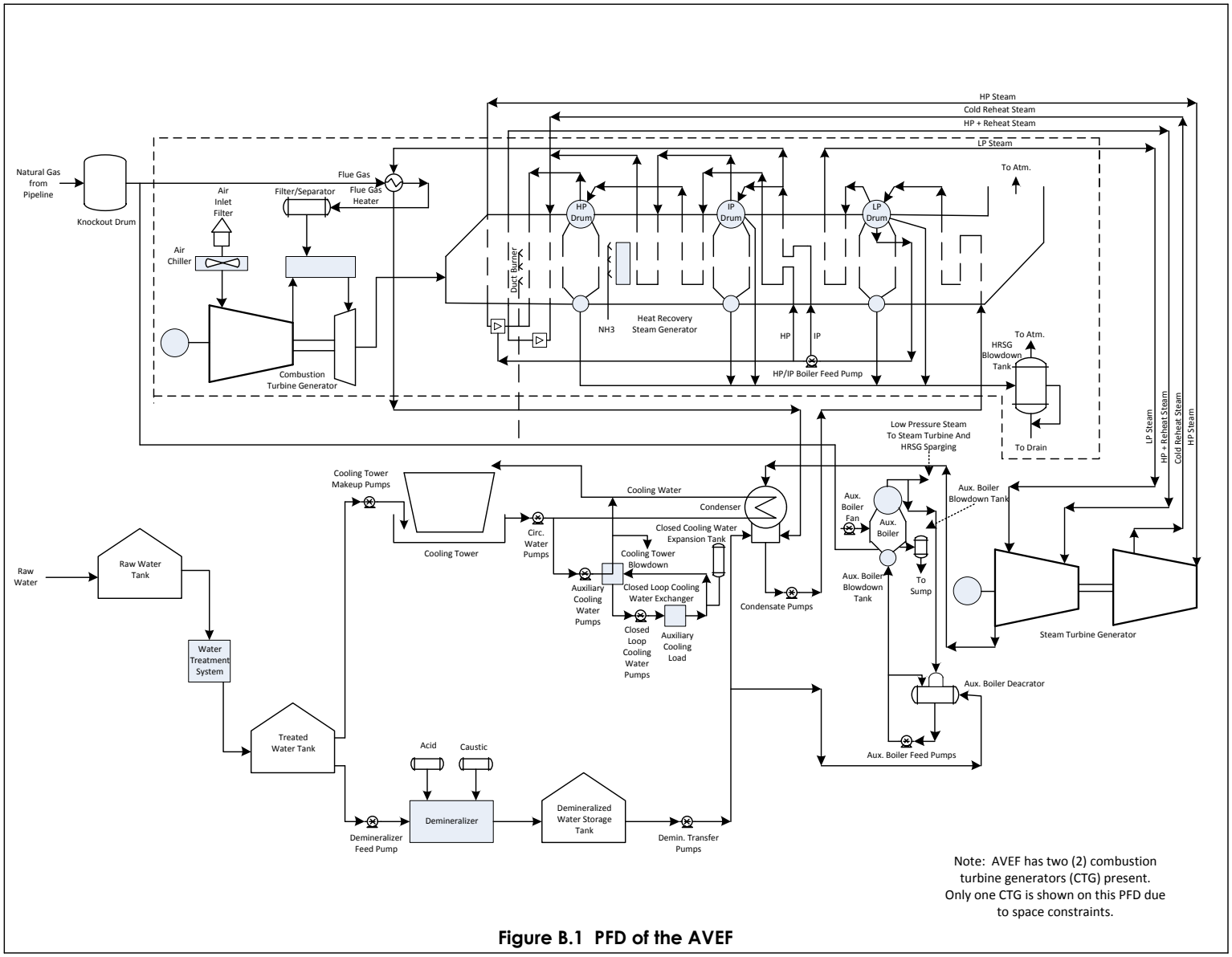
COMPLIANCE CERTIFICATION

I certify that I have knowledge of the facts herein set forth, that the same are true, accurate and complete to the best of my knowledge and belief, and that all information not identified by me as confidential in nature shall be treated by MCAQD as public record. I also attest that I am in compliance with the applicable requirements of the Permit and will continue to comply with such requirements and any future requirements that become effective during the life of the Permit.

Name: Gregory Nugent Title: Plant Manager

Signature: _____ Date: _____

APPENDIX B PROCESS FLOW DIAGRAM



Note: AVEF has two (2) combustion turbine generators (CTG) present. Only one CTG is shown on this PFD due to space constraints.

Figure B.1 PFD of the AVEF

APPENDIX C CALCULATION METHODOLOGY

C.1 INTRODUCTION

The methodology used to calculate the emission rates presented in Section 3 of this application is explained in the following sections. Section C.2 describes the methodology used to calculate PM, PM_{10}, and $PM_{2.5}$ emissions. Section C.3 describes the methodology used to calculate CO, NO_X, SO_2, VOC, H_2SO_4, CO_2, CH_4, and N_2O emissions. Section C.4 describes the methodology used to calculate HAP emissions.

C.2 PARTICULATE MATTER EMISSIONS

C.2.1 Combustion Turbine 1 with Duct Burner 1 (combined cycle)

C.2.1.1 Process Rates

The annual and hourly process rates for the Combustion Turbine 1 with Duct Burner 1 (combined cycle) are based on its hours of operation. The Combustion Turbine 1 with Duct Burner 1 is capable of operating continuously (60 minutes/hour and 8,760 hours/year).

C.2.1.2 Emission Factors

For calculation of annual uncontrolled emissions, PM_{10} emissions from the Combustion Turbine 1 with Duct Burner 1 (combined cycle) are calculated using the rolling 12-month total emission limit in Condition 18.A.2, Table 1 of Permit #V99-014 for Combined Cycle System 1 (99.9 tpy). A maximum of 8,760 hours of operation per year is used to calculate the PM_{10} emission factors in units of lb/hr (22.81 lb/hr).

For calculation of hourly uncontrolled emissions, PM_{10} emissions are calculated using the hourly emission limit in Condition 18.A.2, Table 2 of Permit #V99-014 (24.0 lb/hr) for Combustion Turbine 1 with Duct Burners on.

Uncontrolled PM and $PM_{2.5}$ emissions are assumed to equal PM_{10} emissions based on footnote "c" in AP-42, Table 1.4-2 (07/98) and as a worst case emission estimate.

C.2.1.3 Capture/Control Efficiencies

Besides SCR used to control NO_X emissions, other pollution control methods are not implemented on the Combustion Turbine 1 with Duct Burner 1 (combined cycle).

C.2.2 Combustion Turbine 2 with Duct Burner 2 (combined cycle)

C.2.2.1 Process Rates

The annual and hourly process rates for the Combustion Turbine 2 with Duct Burner 2 (combined cycle) are based on its hours of operation. The Combustion Turbine 1 with Duct Burner 1 is capable of operating continuously (60 minutes/hour and 8,760 hours/year).

C.2.2.2 Emission Factors

For calculation of annual uncontrolled emissions, PM_{10} emissions from the Combustion Turbine 2 with Duct Burner 2 (combined cycle) are calculated using the rolling 12-month total emission limit in Condition 18.A.2, Table 1 of Permit #V99-014 for Combined Cycle System 2 (99.9 tpy). A maximum of 8,760 hours of operation per year is used to calculate the PM_{10} emission factors in units of lb/hr (22.81 lb/hr).

For calculation of hourly uncontrolled emissions, PM_{10} emissions are calculated using the hourly emission limit in Condition 18.A.2, Table 2 of Permit #V99-014 (24.0 lb/hr) for Combustion Turbine 2 with Duct Burners on.

Uncontrolled PM and $PM_{2.5}$ emissions are assumed to equal PM_{10} emissions based on footnote "c" in AP-42, Table 1.4-2 (07/98) and as a worst case emission estimate.

C.2.2.3 Capture/Control Efficiencies

Besides SCR used to control NO_X emissions, other pollution control methods are not implemented on the Combustion Turbine 2 with Duct Burner 2 (combined cycle).

C.2.3 Auxiliary Boiler

C.2.3.1 Process Rates

The annual and hourly process rates for the Auxiliary Boiler are based on its hours of operation. The Auxiliary Boiler is capable of operating 60 minutes/hour but is limited to 6,000 hours/year by Condition 19.B of Permit #V99-014.

C.2.3.2 Emission Factors

For calculation of annual uncontrolled emissions, PM_{10} emissions from the Auxiliary Boiler are calculated using the rolling 12-month total emission limit in Condition 18.A.2, Table 1 of Permit #V99-014 (0.9 tpy). A maximum of 6,000 hours of operation per year is used to calculate the PM_{10} emission factors in units of lb/hr (0.30 lb/hr).

For calculation of hourly uncontrolled emissions, PM_{10} emissions are calculated using the hourly emission limit in Condition 18.A.2, Table 4 of Permit #V99-014 (0.33 lb/hr).

Uncontrolled PM and $PM_{2.5}$ emissions are assumed to equal PM_{10} emissions based on footnote "c" in AP-42, Table 1.4-2 (07/98).

C.2.3.3 Capture/Control Efficiencies

Besides good operating practices, other pollution control methods are not implemented on the Auxiliary Boiler.

C.2.4 Engine Associated with the Fire Water Pump (emergency)

C.2.4.1 Process Rates

The annual and hourly process rates for the Engine Associated with the Fire Water Pump (emergency) are based on the power rating of the engine and its hours of operation. The Engine Associated with the Fire Water Pump (emergency) has a power rating of 161 hp and is used only in emergency power situations and for periodic testing and maintenance purposes, estimated at 500 hours/year (see EPA memorandum distributed on September 6, 1995 providing guidance on calculating the PTE for emergency generators). The hourly process rate is calculated assuming one full hour of operation.

C.2.4.2 Emission Factors

Uncontrolled PM_{10} emissions from the Engine Associated with the Fire Water Pump (emergency) are calculated using the emission factor if 0.0022 lb/hp-hr from AP-42, Table 3.3-1 (10/96) for uncontrolled diesel industrial engines. Uncontrolled PM and $PM_{2.5}$ emissions are assumed to equal PM_{10} emissions based on footnote "b" in AP-42, Table 3.3-1 (10/96).

C.2.4.3 Capture/Control Efficiencies

Besides good operating practices, other pollution control methods are not implemented on the Engine Associated with the Fire Water Pump (emergency).

C.2.5 Engine Associated with the Backup Generator (emergency)

C.2.5.1 Process Rates

The annual and hourly process rates for the Engine Associated with the Backup Generator (emergency) are based on the power rating of the engine and its hours of operation. The Engine Associated with the Backup Generator (emergency) has a power rating of 748 hp and is used only in emergency power situations and for periodic testing and maintenance purposes, estimated at 500 hours/year (see EPA memorandum distributed on September 6, 1995 providing guidance on calculating the PTE for emergency generators). The hourly process rate is calculated assuming one full hour of operation.

C.2.5.2 Emission Factors

Uncontrolled PM emissions from the Engine Associated with the Backup Generator (emergency) are calculated using the emission factor if 0.412 g/hp-hr (0.0009 lb/hp-hr) from vendor's data. Uncontrolled PM_{10} and $PM_{2.5}$ emissions are assumed to equal PM emissions based on footnote "b" in AP-42, Table 3.3-1 (10/96).

C.2.5.3 Capture/Control Efficiencies

Besides good operating practices, other pollution control methods are not implemented on the Engine Associated with the Backup Generator (emergency).

C.2.6 Wet Cooling Tower and Chiller Modules

C.2.6.1 Process Rates

The annual and hourly process rates for the Wet Cooling Tower and the Chiller Modules are based on the water circulation rate and continuous operation (60 minutes/hour and 8,760 hours/year). The water circulation rate of the Wet Cooling Tower is 138,300 gallons/minute (6 cells at 23,050 gallons/minute each). The water circulation rate of each Chiller Module is 12,000 gallons/minute.

C.2.6.2 Emission Factors

Controlled PM, PM_{10}, and $PM_{2.5}$ emissions from the operation of the Wet Cooling Tower and the Chiller Modules are calculated using the following equation adapted from AP-42, Section 13.4 (01/95):

$$EF = (k)\left(\frac{Q_d \text{ lb drift}}{\text{lb CT water}}\right)\left(\frac{8.34 \text{ lb CT water}}{\text{gallon CT water}}\right)\left(\frac{\text{TDS lb disolved solids}}{\text{lb drift}}\right)\left(\frac{1{,}000 \text{ gallons CT water}}{1{,}000 \text{ gallons CT water}}\right)$$

where:

EF = emission factor (lb/1,000 gallons);

k = particle size multiplier (1 for PM, 0.315 for PM_{10} based on Condition 18.A.2, Note "h" of Permit #V99-014, the $PM_{2.5}$ particle size multiplier is assumed equal to the PM_{10} particle size multiplier as a worst case emission estimate);

Q_d = drift rate (lb drift/lb cooling tower water, maximum of 0.00001 lb drift/lb cooling tower water (0.001% drift) based on Condition 19.C.1 of Permit #V99-014; and

TDS = total dissolved solids concentration in the drift (lb of dissolved solids/lb drift, maximum of 0.019058 lb of dissolved solids/lb drift (19,058 mg/l) based on Condition 19.C.2 of Permit #V99-014.

C.2.6.3 Capture/Control Efficiencies

Besides the use of a drift eliminator, additional pollution control methods are not implemented during the use of the Wet Cooling Tower or the Chiller Modules.

C.3 GASEOUS EMISSIONS

C.3.1 Combustion Turbine 1 with Duct Burner 1 (combined cycle)

C.3.1.1 Process Rates

The annual and hourly process rates for the Combustion Turbine 1 with Duct Burner 1 (combined cycle) are identical to those described in Section C.2.1.1.

C.3.1.2 Emission Factors

For annual emissions, CO, NO_X, SO_2, and VOC from the Combustion Turbine 1 with Duct Burner 1 (combined cycle) are calculated using the rolling 12-month total emission limits in Condition 18.A.2, Table 1 of Permit #V99-014 for Combined Cycle System 1. A maximum of 8,760 hours of operation per year is used to calculate the CO, NO_X, SO_2, and VOC emission factors in units of lb/hr.

For hourly emissions, CO emissions are calculated using the hourly emission limit in Condition 18.A.2, Table 3, Note 1 of Permit #V99-014. NO_X and VOC are calculated using the lb/event emission limits in Condition 18.A.2, Table 3 of Permit #V99-014 for startup conditions. SO_2 emissions are calculated using the hourly emission limit in Condition 18.A.2, Table 2 of Permit #V99-014 for Combustion Turbine 1 with Duct Burners on. The CO, NO_X, and VOC limits are for the combined operation of the Combined Cycle 1 System and the Combined Cycle 2 System. Consequently, emissions from only the Combustion Turbine 1 with Duct Burner 1 (combined cycle) are assumed to be 50% of the total emission limit. The NO_X and VOC emission limits are converted to units of lb/hour assuming 1 startup event lasts 1.85 hours.

For both annual and hourly emissions, CO_2, CH_4, and N_2O are calculated using the emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2 for natural gas. The sum of the maximum heat input rates of the Combustion Turbine 1 and Duct Burner 1 (1,740.805 MMBtu/hr + 356.6 MMBtu/hr) is used to calculate the CO_2, CH_4, and N_2O emission factors in units of lb/hr.

The gaseous emission factors for the Combustion Turbine 1 with Duct Burner 1 (combined cycle) are presented in Table D.1.

C.3.1.3 Capture/Control Efficiencies

Besides SCR used to control NO_X emissions, other pollution control methods are not implemented on the Combustion Turbine 1 with Duct Burner 1 (combined cycle). The control efficiency of the SCR system is incorporated into the NO_X emission factors discussed in Section C.3.1.2.

Table C.1 Gaseous Emission Factors for the Combustion Turbine 1 with Duct Burner 1 (combined cycle)

Gaseous Pollutant	Annual Emission Factor	Hourly Emission Factor	Reference
CO	438.1 tpy (100.0 lb/hr)	2,520 lb/hr * 50% (1,260 lb/hr)	Condition 18.A.2, Table 1 (annual) Condition 18.A.2, Table 3 (hourly)
NO_X	121.1 tpy (27.6 lb/hr)	799 lb/event * 50% (215.9 lb/hr)	Condition 18.A.2, Table 1 (annual) Condition 18.A.2, Table 3 (hourly)
SO_2	19.8 tpy (4.5 lb/hr)	5.25 lb/hr	Condition 18.A.2, Table 1 (annual) Condition 18.A.2, Table 2 (hourly)
VOC	61.6 tpy (14.1 lb/hr)	142 lb/event * 50% (38.4 lb/hr)	Condition 18.A.2, Table 1 (annual) Condition 18.A.2, Table 3 (hourly)
CO_2	53.06 kg/MMBtu (245,349 lb/hr)		40 CFR 98, Subpart C, Table C-1
CH_4	$1.0 * 10^{-3}$ kg/MMBtu (4.62 lb/hr)		40 CFR 98, Subpart C, Table C-2
N_2O	$1.0 * 10^{-4}$ kg/MMBtu (0.46 lb/hr)		40 CFR 98, Subpart C, Table C-2

C.3.2 Combustion Turbine 2 with Duct Burner 2 (combined cycle)

C.3.2.1 Process Rates

The annual and hourly process rates for the Combustion Turbine 2 with Duct Burner 2 (combined cycle) are identical to those described in Section C.2.2.1.

C.3.2.2 Emission Factors

For annual emissions, CO, NO_X, SO_2, and VOC from the Combustion Turbine 2 with Duct Burner 2 (combined cycle) are calculated using the rolling 12-month total emission limits in Condition 18.A.2, Table 1 of Permit #V99-014 for Combined Cycle System 2. A maximum of 8,760 hours of operation per year is used to calculate the CO, NO_X, SO_2, and VOC emission factors in units of lb/hr.

For hourly emissions, CO emissions are calculated using the hourly emission limit in Condition 18.A.2, Table 3, Note 1 of Permit #V99-014. NO_X and VOC are calculated using the lb/event emission limits in Condition 18.A.2, Table 3 of Permit #V99-014 for startup conditions. SO_2 emissions are calculated using the hourly emission limit in Condition 18.A.2, Table 2 of Permit #V99-014 for Combustion Turbine 2 with Duct Burners on. The CO, NO_X, and VOC limits are for the combined operation of the Combined Cycle 1 System and the Combined Cycle 2

System. Consequently, emissions from only the Combustion Turbine 2 with Duct Burner 2 (combined cycle) are assumed to be 50% of the total emission limit. The NO_X and VOC emission limits are converted to units of lb/hour assuming 1 startup event lasts 1.85 hours.

For both annual and hourly emissions, CO_2, CH_4, and N_2O are calculated using the emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2 for natural gas. The sum of the maximum heat input rates of the Combustion Turbine 2 and Duct Burner 2 (1,740.805 MMBtu/hr + 356.6 MMBtu/hr) is used to calculate the CO_2, CH_4, and N_2O emission factors in units of lb/hr.

The gaseous emission factors for the Combustion Turbine 2 with Duct Burner 2 (combined cycle) are presented in Table D.2.

Table C.2 Gaseous Emission Factors for the Combustion Turbine 2 with Duct Burner 2 (combined cycle)

Gaseous Pollutant	Annual Emission Factor	Hourly Emission Factor	Reference
CO	438.1 tpy (100.0 lb/hr)	2,520 lb/hr * 50% (1,260 lb/hr)	Condition 18.A.2, Table 1 (annual) Condition 18.A.2, Table 3 (hourly)
NO_X	121.1 tpy (27.6 lb/hr)	799 lb/event * 50% (215.9 lb/hr)	Condition 18.A.2, Table 1 (annual) Condition 18.A.2, Table 3 (hourly)
SO_2	19.8 tpy (4.5 lb/hr)	5.25 lb/hr	Condition 18.A.2, Table 1 (annual) Condition 18.A.2, Table 2 (hourly)
VOC	61.6 tpy (14.1 lb/hr)	142 lb/event * 50% (38.4 lb/hr)	Condition 18.A.2, Table 1 (annual) Condition 18.A.2, Table 3 (hourly)
CO_2	53.06 kg/MMBtu (245,349 lb/hr)		40 CFR 98, Subpart C, Table C-1
CH_4	$1.0 * 10^{-3}$ kg/MMBtu (4.62 lb/hr)		40 CFR 98, Subpart C, Table C-2
N_2O	$1.0 * 10^{-4}$ kg/MMBtu (0.46 lb/hr)		40 CFR 98, Subpart C, Table C-2

C.3.2.3 Capture/Control Efficiencies

Besides SCR used to control NO_X emissions, other pollution control methods are not implemented on the Combustion Turbine 2 with Duct Burner 2 (combined cycle). The control efficiency of the SCR system is incorporated into the NO_X emission factors discussed in Section C.3.1.2.

C.3.3 Auxiliary Boiler

C.3.3.1 Process Rates

The annual and hourly process rates for the Auxiliary Boiler are identical to those described in Section C.2.3.1.

C.3.3.2 Emission Factors

For annual uncontrolled emissions, CO, NO_X, SO_2, and VOC from the Auxiliary Boiler are calculated using the rolling 12-month total emission limits in Condition 18.A.2, Table 1 of Permit #V99-014. A maximum of 6,000 hours of operation per year is used to calculate the CO, NO_X, SO_2, and VOC emission factors in units of lb/hr.

For hourly uncontrolled emissions, CO, NO_X, SO_2, and VOC are calculated using the hourly and lb/MMBtu emission limits in Condition 18.A.2, Tables 4 and 5 of Permit #V99-014. The NO_X emission limit in units of lb/MMBtu is converted to units of lb/hr using the maximum heat input rate of the Auxiliary Boiler (33 MMBtu/hr).

For both annual and hourly emissions, uncontrolled CO_2, CH_4, and N_2O are calculated using the emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2 for natural gas. The maximum heat input rate of the Auxiliary Boiler (33 MMBtu/hr) is used to calculate the CO_2, CH_4, and N_2O emission factors in units of lb/hr.

The gaseous emission factors for the Auxiliary Boiler are presented in Table D.3.

C.3.3.3 Capture/Control Efficiencies

Besides good operating practices, other pollution control methods are not implemented on the Auxiliary Boiler.

Table C.3 Gaseous Emission Factors for the Auxiliary Boiler

Gaseous Pollutant	Annual Emission Factor	Hourly Emission Factor	Reference
CO	14.1 tpy (4.70 lb/hr)	4.95 lb/hr	Condition 18.A.2, Table 1 (annual) Condition 18.A.2, Table 4 (hourly)
NO_X	3.3 tpy (1.10 lb/hr)	0.035 lb/MMBtu (1.16 lb/hr)	Condition 18.A.2, Table 1 (annual) Condition 18.A.2, Table 5 (hourly)
SO_2	0.2 tpy (0.07 lb/hr)	0.08 lb/hr	Condition 18.A.2, Table 1 (annual) Condition 18.A.2, Table 4 (hourly)
VOC	1.5 tpy (0.50 lb/hr)	0.53 lb/hr	Condition 18.A.2, Table 1 (annual) Condition 18.A.2, Table 4 (hourly)
CO_2	53.06 kg/MMBtu (3,860 lb/hr)		40 CFR 98, Subpart C, Table C-1
CH_4	$1.0 * 10^{-3}$ kg/MMBtu (0.07 lb/hr)		40 CFR 98, Subpart C, Table C-2
N_2O	$1.0 * 10^{-4}$ kg/MMBtu (0.007 lb/hr)		40 CFR 98, Subpart C, Table C-2

C.3.4 Engine Associated with the Fire Water Pump (emergency)

C.3.4.1 Process Rates

The annual and hourly process rates for the Engine Associated with the Fire Water Pump (emergency) are identical to those described in Section C.2.4.1.

C.3.4.2 Emission Factors

Uncontrolled CO and NO_X emissions from the Engine Associated with the Fire Water Pump (emergency) are calculated using the emission factors from AP-42, Table 3.3-1 (10/96) for diesel industrial engines. Uncontrolled VOC emissions are calculated using an emission factor consisting of the sum of the exhaust, evaporative, crankcase, and refueling total organic carbon (TOC) emission factors presented in AP-42, Table 3.3-1 (10/96) for diesel industrial engines.

Uncontrolled SO_2 emissions are calculated assuming all the sulfur in the diesel fuel combusted in the engine is converted to SO_2 emissions. AVEF uses ultra-low sulfur diesel (ULSD) fuel, which has a sulfur content of 0.0015%. Uncontrolled CO_2, CH_4, and N_2O emissions are calculated using the emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2 for distillate fuel oil No. 2.

A diesel heating value of 19,300 Btu/pound of diesel fuel and an average brake-specific fuel consumption value of 7,000 Btu/hp-hr are used to calculate the SO_2, CO_2, CH_4, and N_2O emission factors in units of lb/hp-hr.

The gaseous emission factors for the Engine Associated with the Fire Water Pump (emergency) are presented in Table D.4.

Table C.4 Gaseous Emission Factors for the Engine Associated with the Fire Water Pump (emergency)

Gaseous Pollutant	Emission Factor	Reference
CO	0.00668 lb/hp-hr	AP-42, Table 3.3-1 (10/96)
NO_X	0.031 lb/hp-hr	AP-42, Table 3.3-1 (10/96)
SO_2	0.00001 lb/hp-hr	Complete Sulfur Conversion, Sulfur Content of 0.0015%
VOC	0.0025 lb/hp-hr	AP-42, Table 3.3-1 (10/96), Sum of TOC Emission Factors
CO_2	73.96 kg/MMBtu (1.14 lb/hp-hr)	40 CFR 98, Subpart C, Table C-1
CH_4	$3.0 * 10^{-3}$ kg/MMBtu (0.00005 lb/hp-hr)	40 CFR 98, Subpart C, Table C-2
N_2O	$6.0 * 10^{-4}$ kg/MMBtu (0.000009 lb/hp-hr)	40 CFR 98, Subpart C, Table C-2

C.3.4.3 Capture/Control Efficiencies

Besides good operating practices, other pollution control methods are not implemented on the Engine Associated with the Fire Water Pump (emergency).

C.3.5 Engine Associated with the Backup Generator (emergency)

C.3.5.1 Process Rates

The annual and hourly process rates for the Engine Associated with the Backup Generator (emergency) are identical to those described in Section C.2.5.1.

C.3.5.2 Emission Factors

Uncontrolled CO, NO_X, and VOC emissions from the Engine Associated with the Backup Generator (emergency) are calculated using the emission factor based on vendor's data.

Uncontrolled SO_2 emissions are calculated assuming all the sulfur in the diesel fuel combusted in the engine is converted to SO_2 emissions. AVEF uses ultra-low sulfur diesel (ULSD) fuel, which has a sulfur content of 0.0015%. Uncontrolled CO_2, CH_4, and N_2O emissions are calculated using the emission factors from 40 CFR 98, Subpart C, Tables C-1 and C-2 for distillate fuel oil No. 2.

A diesel heating value of 19,300 Btu/pound of diesel fuel and an average brake-specific fuel consumption value of 7,000 Btu/hp-hr are used to calculate the SO_2, CO_2, CH_4, and N_2O emission factors in units of lb/hp-hr.

The gaseous emission factors for the Engine Associated with the Backup Generator (emergency) are presented in Table D.5.

Table C.5 Gaseous Emission Factors for the Engine Associated with the Backup Generator (emergency)

Gaseous Pollutant	Emission Factor	Reference
CO	8.501 g/hp-hr (0.02 lb/hp-hr)	Vendor's Data
NO_X	8.824 g/hp-hr (0.02 lb/hp-hr)	Vendor's Data
SO_2	0.00001 lb/hp-hr	Complete Sulfur Conversion, Sulfur Content of 0.0015%
VOC	1.000 g/hp-hr (0.002 lb/hp-hr)	Vendor's Data
CO_2	73.96 kg/MMBtu (1.14 lb/hp-hr)	40 CFR 98, Subpart C, Table C-1
CH_4	$3.0 * 10^{-3}$ kg/MMBtu (0.00005 lb/hp-hr)	40 CFR 98, Subpart C, Table C-2
N_2O	$6.0 * 10^{-4}$ kg/MMBtu (0.000009 lb/hp-hr)	40 CFR 98, Subpart C, Table C-2

C.3.5.3 Capture/Control Efficiencies

Besides good operating practices, other pollution control methods are not implemented on the Engine Associated with the Backup Generator (emergency).

C.4 HAP EMISSIONS

C.4.1 Combustion Turbine 1 with Duct Burner 1 (combined cycle)

C.4.1.1 Process Rates

The annual and hourly process rates for the Combustion Turbine 1 with Duct Burner 1 (combined cycle) are based on the heat input rates of the combustion turbine and duct burner and their hours of operation. Combustion Turbine 1 has a heat input rate of 1,740.805 MMBtu/hour and is capable of operating continuously (8,760 hours/year and 60 minutes/hour). Duct Burner 1 has a heat input rate of 356.6 MMBtu/hour and is also capable of operating continuously (8,760 hours/year and 60 minutes/hour).

C.4.1.2 Emission Factors

HAP emissions are calculated separately for the Combustion Turbine 1 and the Duct Burner 1. Except for formaldehyde, uncontrolled HAP emissions from the Combustion Turbine 1 are calculated using the emission factors from AP-42, Table 3.1-3 (04/00) for natural gas fired stationary gas turbines. The emission factors are converted to a natural gas heating value of 1,004 Btu/scf by multiplying by 1,020 Btu/scf and dividing by 1,004 Btu/scf. Uncontrolled formaldehyde emissions are calculated using an emission factor of 0.0003649 lb/MMBtu, which is based on a subset of the AP-42 database and a regression analysis (see Section 3.8.1 of the 2005 Title V Renewal Application for more information).

Except for hexane, uncontrolled HAP emissions from the Duct Burner 1 are calculated using the emission factors from AP-42, Tables 1.4-2, 1.4-3, and 1.4-4 (07/98) for natural gas combustion. Uncontrolled hexane emissions are calculated using an emission factor of 0.0716 lb/MMscf, which is based on an average destruction removal efficiency, the manufacturer's guarantee for total unburned hydrocarbons, and the typical composition of natural gas (see Section 3.8.2 of the 2005 Title V Renewal Application for more information). A natural gas heating value of 1,004 Btu/scf is used to calculate the HAP emission factors in units of lb/MMBtu.

C.4.1.3 Capture/Control Efficiencies

Besides SCR used to control NO_X emissions, other pollution control methods are not implemented on the Combustion Turbine 1 with Duct Burner 1 (combined cycle).

C.4.2 Combustion Turbine 2 with Duct Burner 2 (combined cycle)

C.4.2.1 Process Rates

The annual and hourly process rates for the Combustion Turbine 2 with Duct Burner 2 (combined cycle) are based on the heat input rates of the combustion turbine and duct burner and their hours of operation. Combustion Turbine 2 has a heat input rate of 1,740.805 MMBtu/hour and is capable of operating continuously (8,760 hours/year and 60 minutes/hour). Duct Burner 2 has a heat input rate of 356.6 MMBtu/hour and is also capable of operating continuously (8,760 hours/year and 60 minutes/hour).

C.4.2.2 Emission Factors

HAP emissions are calculated separately for the Combustion Turbine 2 and the Duct Burner 2. Except for formaldehyde, uncontrolled HAP emissions from the Combustion Turbine 2 are calculated using the emission factors from AP-42, Table 3.1-3 (04/00) for natural gas fired stationary gas turbines. The emission factors are converted to a natural gas heating value of 1,004 Btu/scf by multiplying by 1,020 Btu/scf and dividing by 1,004 Btu/scf. Uncontrolled formaldehyde emissions are calculated using an emission factor of 0.0003649 lb/MMBtu, which is based on a subset of the AP-42 database and a regression analysis (see Section 3.8.1 of the 2005 Title V Renewal Application for more information).

Except for hexane, uncontrolled HAP emissions from the Duct Burner 2 are calculated using the emission factors from AP-42, Tables 1.4-2, 1.4-3, and 1.4-4 (07/98) for natural gas combustion. Uncontrolled hexane emissions are calculated using an emission factor of 0.0716 lb/MMscf, which is based on an average destruction removal efficiency, the manufacturer's guarantee for total unburned hydrocarbons, and the typical composition of natural gas (see Section 3.8.2 of the 2005 Title V Renewal Application for more information). A natural gas heating value of 1,004 Btu/scf is used to calculate the HAP emission factors in units of lb/MMBtu.

C.4.2.3 Capture/Control Efficiencies

Besides SCR used to control NO_X emissions, other pollution control methods are not implemented on the Combustion Turbine 2 with Duct Burner 2 (combined cycle).

C.4.3 Auxiliary Boiler

C.4.3.1 Process Rates

The annual and hourly process rates for the Auxiliary Boiler are identical to those described in Section C.2.3.1.

C.4.3.2 Emission Factors

Except for hexane, uncontrolled HAP emissions from the Auxiliary Boiler are calculated using the emission factors from AP-42, Tables 1.4-2, 1.4-3, and 1.4-4 (07/98) for natural gas combustion. Uncontrolled hexane emissions are calculated using an emission factor of 0.0716 lb/MMscf, which is based on an average destruction removal efficiency, the manufacturer's guarantee for total unburned hydrocarbons, and the typical composition of natural gas (see Section 3.8.2 of the 2005 Title V Renewal Application for more information). The maximum heat input rate of the Auxiliary Boiler (33 MMBtu/hr) and a natural gas heating value of 1,004 Btu/scf are used to calculate the HAP emission factors in units of lb/hr.

C.4.3.3 Capture/Control Efficiencies

Besides good operating practices, other pollution control methods are not implemented on the Auxiliary Boiler.

C.4.4 Engine Associated with the Fire Water Pump (emergency)

C.4.4.1 Process Rates

The annual and hourly process rates for the Engine Associated with the Fire Water Pump (emergency) are identical to those described in Section C.2.4.1.

C.4.4.2 Emission Factors

Uncontrolled HAP emissions from the Engine Associated with the Fire Water Pump (emergency) are calculated using the emission factors from AP-42, Table 3.3-2 (10/96) for uncontrolled diesel engines. An average brake-specific fuel consumption value of 7,000 Btu/hp-hr is used to calculate the HAP emission factors in units of lb/hp-hr.

C.4.4.3 Capture/Control Efficiencies

Besides good operating practices, other pollution control methods are not implemented on the Engine Associated with the Fire Water Pump (emergency).

C.4.5 Engine Associated with the Backup Generator (emergency)

C.4.5.1 Process Rates

The annual and hourly process rates for the Engine Associated with the Backup Generator (emergency) are identical to those described in Section C.2.5.1.

C.4.5.2 Emission Factors

Uncontrolled HAP emissions from the Engine Associated with the Backup Generator (emergency) are calculated using the emission factors from AP-42, Tables 3.4-3 and 3.4-4 (10/96) for large uncontrolled diesel engines. An average brake-specific fuel consumption value of 7,000 Btu/hp-hr is used to calculate the HAP emission factors in units of lb/hp-hr.

C.4.5.3 Capture/Control Efficiencies

Besides good operating practices, other pollution control methods are not implemented on the Engine Associated with the Backup Generator (emergency).

C.4.6 Hydrochloric Acid Tank

C.4.6.1 Process Rates

The annual and hourly process rates for the hydrochloric acid tank are 150,000 and 17.1 gallons, respectively.

C.4.6.2 Emission Factors

Uncontrolled HAP emissions from the Hydrochloric Acid Tank were calculated using the EPA TANKS program, version 4.0.9d. The total annual emissions calculated by the TANKS program were divided by 8,760 hours to calculate an hourly emission rate. The TANKS program output is provided in Appendix E.

C.4.6.3 Capture/Control Efficiencies

Besides breather vents to allow the internal tank pressure to fluctuate with the outside atmosphere, other pollution control methods are not implemented on the Hydrochloric Acid Tank.

APPENDIX D EMISSION INVENTORY TABLES

APPENDIX E EPA TANKS PROGRAM OUTPUT